

## **Allan S. Hoffman**

(Updated Jan., 2016)

### **Education**

1953, BS in Chemical Engineering, MIT (Cambridge, Mass.)  
1955, MS in Chemical Engineering, MIT  
1957, ScD in Chemical Engineering, MIT



### **Academic Career (MIT and University of Washington)**

2010-present **Professor Emeritus**, Bioengineering, University of Washington, Seattle, WA  
2009-2014 **World Class University (WCU) Distinguished Professor** (part-time),  
Kyungpook National University Medical School, Daegu, So. Korea  
1970-2010 **Professor**, Bioengineering and Chemical Engineering, University of Washington,  
Seattle, WA  
1973-1983 **Assistant Director**, Center for Bioengineering, University of Washington,  
Seattle, WA  
1964-1970 **Associate Professor**, Chemical Engineering, M.I.T. Cambridge, MA  
1958-1960 **Assistant Professor**, Chemical Engineering, M.I.T., Cambridge, MA  
1954-1956 **Instructor**, Chemical Engineering, M.I.T., Cambridge, MA and 1954-55  
**Assistant Director**, M.I.T., Chemical Eng'g Practice School, Oak Ridge, TN

### **Selected Honors, Recognitions and Awards**

(NOTE: This list includes only a selected few of many invited lectures, including plenary and keynote lectures, given over the past 40+ years at conferences, universities and companies in the US and overseas)

2015 **Hoffman Family Symposium 3** will take place in Seoul Korea, in March, 2015.

2014

- Presented 2 **Invited lectures** in a short course on Biomaterials at Havana University, Havana Cuba, November, 2014
- Presented an **Invited Lecture** at the Symposium on Innovative Polymers for Drug Delivery, Soochow University, Suzhou, China, September, 2014
- Presented **four invited class lectures** at Sichuan University, Chengdu, China, September, 2014
- A special symposium in my honor, called the "**Hoffman Family Symposium 2**", was held March 23-25 at the National Institute of Materials Science (NIMS) in Tsukuba, Japan. Over 80 scientists attended from Japan, Korea, Singapore, China, Taiwan, Canada and the US. Many were scientists with whom I have collaborated (mostly from Japan and Korea) over the past 40 years.

2013 **Invited Special Symposium Lectures**: Zhejiang Univ, Hangzhou, China, Dec. 2013  
**Invited Plenary Lecture**: Royal Society of Chemistry, 11<sup>th</sup> Materials Chemistry Conference, MC11, Warwick, UK, July, 2013  
**Invited Keynote Lecture**: European Soc. Biomaterials, Madrid, Sept. 2013

- Invited Lectures:** South China University of Technology, Guangzhou, China, January, 2013; University of California at Berkeley, Feb, 2013; Chugai Pharmaceutical Corp, Gotemba, Japan, March, 2013; Tsukuba University, Tsukuba, Japan, March, 2013; Institute of Biomaterials Science, Berlin, Germany, May, 2013; Pusan National University, Busan, Korea, June, 2013; Hanyang University, Seoul, Korea, June, 2013; NanoDDS'13, UCSD, San Diego, CA, Oct. 2013; Shanghai Univ, Shanghai, China, Dec. 2013
- 2012 **Invited Plenary Address:** 10<sup>th</sup> Conf. on Irradiation & Polymers, Krakow, Poland, October, 2012  
**Invited Plenary Address:** 9<sup>th</sup> World Biomaterials Congress, Chengdu, China, June 2012
- 2011 **Three Plenary Addresses:** Molecules and Materials M3 Meeting, IMRE, Singapore, Jan., 2011;  
European Polymer Federation, Granada, Spain, July, 2011;  
ACS Polymer Division, Polymers in Medicine and Biology, Santa Rosa, CA, September, 2011
- 2011 **Invited Lectures:** Zhongguancun Forum, Beijing, PR China; Tsinghua University Chemistry Department, September, 2011  
Sungkyunkwan University, Suwon, Korea, October, 2011  
Seoul National University, Seoul, Korea, October, 2011
- 2011 **Keynote Address:** International Congress on Biohydrogels, Florence, Italy, Nov. 2011
- 2010 **Keynote Address:** Society for Biomaterials Annual Meeting, Seattle, WA, April, 2010
- 2009 **Plenary Address:** Controlled Release Society Annual meeting, Copenhagen, Denmark, July, 2009
- 2007 **Founder's Award, Controlled Release Society, USA**
- 2007 **Keynote Address:** Society for Biomaterials Annual Meeting, Chicago, April, '07
- 2006 **International Award from Society of Polymer Science, Japan**
- 2005 **Elected to the National Academy of Engineering, USA**
- 2003 **Chandra Sharma Award of the Society for Biomaterials and Artificial Organs of India, Mumbai, India**

- 2003 **Seven Plenary Lectures:** ACS Spring meeting, New Orleans; European Polymer Federation, Stockholm, Sweden; Applied Materials Conference, Badajoz, Spain; 7<sup>th</sup> Brazilian Polymer Congress, Belo Horizonte, Brazil; 8<sup>th</sup> Pacific Polymer Federation Conference, Bangkok, Thailand; Materials Research Society of Singapore, Singapore, Society for Biomaterials and Artificial Organs of India, Mumbai, India
- 2002 **An international symposium was held in honor of my 70<sup>th</sup> birthday in Maui, Hawaii, with over 120 attending.** (A Festschrift was published in *J. Biomaterials Science, Polymer Edition* in 2003-04, and a book was published in 2005 with the Festschrift articles).
- 2000 **Founder's Award, Society for Biomaterials,** 6<sup>th</sup> World Congress on Biomaterials, Maui, Hawaii
- 1999 **Recognition Award for "Excellence in Guiding Graduate Student Research", Controlled Release Society,** Boston, MA (Outstanding PhD paper award to C Lackey)
- 1997 **Alan S. Michaels Lectureship,** MIT
- 1992 **An international symposium held in honor of my 60<sup>th</sup> birthday in Maui, Hawaii, with over 140 attending.** (A Festschrift was published in *J. Biomaterials Science, Polymer Edition* in 1993-94, and a book was published in 1995 with the Festschrift articles).
- 1992 **Founding Fellow of American Institute of Medical and Biological Engineering**
- 1991-1994 **Member of Board of Governors, Controlled Release Society**
- 1990 **Biomaterials Science Prize, Society for Biomaterials, Japan** (This was the first time this prize was given to a foreigner)
- 1990 **Recognition Award for "Excellence in Guiding Graduate Research", Controlled Release Society,** Chicago, IL (Outstanding PhD paper award to LC Dong)
- 1986-1989 **Trustee and Member of Board of Directors of the International Society of Artificial Organs**
- 1984 **Clemson Award** for "Contributions to the Scientific Literature of Biomaterials"
- 1983-1984 **President, Society for Biomaterials**
- 1980 **Lederle Science Lecturer,** Lederle Corp., Pearl River, New York
- 1977 **Chairman, Gordon Conference on Biomaterials**
- 1957-58 **Fulbright Fellow,** Paris, France

## **Research Activities and Interests**

### **1) Design of “smart” pH-responsive polymers to enhance intracellular drug delivery**

We are designing pH-responsive polymers to mimic the membrane disruptive action of viral fusogenic peptides in order to facilitate endosomal escape to the cytosol of fragile nucleic acid or protein/peptide drugs. We are also incorporating disulfide groups in our polymers to take advantage of glutathione reduction in the cytosol, which helps to release the drug from the carrier polymer. We are using living free radical techniques such as RAFT to prepare “smart” telechelic block copolymers having both controlled MWs and reactive chain ends. We can conjugate or complex the drug and a ligand targeting agent at each end. These nano-scale carriers are being used for intracellular delivery of drugs that include small hydrophobic drugs, siRNA, pDNA, antisense ODNs, peptides and proteins.

### **2) Applications of smart polymers and nanoparticles for use in diagnostic immunoassays**

We are investigating the uses of sharply phase-separating, smart polymer-protein and nucleic acid conjugates and complexes for various applications in diagnostics. Such “smart” temperature- and pH-responsive polymers are being coated onto polymeric, magnetic and gold nanoparticles and incorporated into microfluidic devices and lateral flow strip dipsticks for use in point-of-care (POC) diagnostic immunoassays.

### **3) Site-specific conjugates of smart polymers and genetically-engineered proteins**

Specific sites in proteins, usually near the active site, may be genetically-engineered to permit conjugation of controlled MW, smart polymers having linear, block or graft copolymer structures. The activity of the proteins in these bioconjugates can be controlled by stimulating the polymer to collapse or rehydrate using small temperature, light or pH changes. Applications include affinity separations, diagnostics, biosensors, bioprocesses and drug delivery.

### **4) Surface modification and characterization of polymeric biomaterials**

Surfaces are modified with plasma gas discharge treatments, UV photografting, or by chemical reactions to make them more or less reactive or bioreactive. Biomolecules may be immobilized on the treated surfaces. This is relevant to many applications in affinity separations, diagnostics, biosensors, bioprocesses and drug delivery.

## **Teaching and Textbook Activities**

### **Teaching at MIT (1954-1970):**

I spent a total of ten years on the faculty of the Department of Chemical Engineering at MIT during various years between 1954-1970, and during this period I taught 9 different courses, including heat transfer, principles of surface and colloidal systems, industrial stoichiometry, polymer structure and properties, thermodynamics, unit operations laboratory, and others.

### **Teaching at University of Washington (1970 to present):**

#### **Chemical Engineering Department and Center for Bioengineering:**

I taught several courses in the ChemE Department when I first arrived in the 1970s, including Unit Operations Lab and Principles of Surface and Colloid Chemistry. My teaching activities in the UW ChemE Department evolved into joint courses with the Center for Bioengineering, which subsequently became courses in the Bioengineering Department when the Center became a Department in the mid-1980s. The following are the joint Bioeng/ChemE courses that I have taught:

**BIOE/CHEME 490: Biomaterials** This course is an introductory course to the different classes and forms of biomaterials used in implants and medical devices, and also in biotechnology (e.g., for separations, diagnostics, sensors, and bioprocesses). Materials science and engineering of polymers, metals, ceramics and glasses, and natural polymers are covered. Bioresponses to those materials, such as blood coagulation and tissue inflammation and encapsulation are also covered. Principles of surface energetics, surface modification and characterization are also covered, especially in contact with biologic media. I initiated this course at the UW in the 1980s.

**BIOE/CHEME 491: Drug Delivery Systems** This course covers the controlled release of drugs from polymeric carriers and devices. Coverage includes the design principles, materials and mechanisms, and performance of systems used for controlled delivery of drugs to the skin, mucosal tissues, lungs, oral, sub-cutaneous tissues, intra-muscular tissues, and IV injections. Coverage includes drug delivery systems such as transdermal patches iontophoretic skin patches, osmotic pumps, degradable microparticles, thermally-gelling depot systems, swelling and gelling hydrogels, polymer-drug conjugates, PEGylated drugs, coated stents, ophthalmic inserts, nasal and pulmonary aerosols, and others. I initiated this course at the UW in the 1980s.

**BIOE/CHEME 590: Advanced Biomaterials** This course follows BIOE 490 and has in-depth lectures plus student reviews of related current literature covering 10 topics of current importance to the field of biomaterials. Lectures by implant clinicians are included.

**BIOE/CHEME 571: Advanced Polymer Systems** This course has in-depth lectures plus student reviews of related current literature covering 10 topics of importance to the field of polymer synthesis, structure and properties. (Taught by Hoffman and Ratner)

**BIOE/CHEME 511: Biomaterials seminar** This is a weekly seminar where each week two students each give a 30 minute seminar on their biomaterials-related research. (Organized in three quarters, by Hoffman, Ratner and Horbett)

**BIOE 510: Bioengineering seminar** This is a twice weekly seminar where each week two professors describe their research program to the new graduate students.

### **Short Courses**

In 1976, I organized and taught the first course in biomaterials, medical devices and implants in France, and I taught it in French. It was held in two cities, Paris and Bordeaux.

In November, 1983 I taught the first short course ever in China on biomaterials and drug delivery. It was held in Shanghai, with over 50 Chinese scientists representing the major universities throughout China attending.

In the late 1980s I was invited to Australia by one of my former students to organize and teach a new short course on biomaterials, implants and devices at the University of New South Wales in Sydney. I taught that course two more times in subsequent years, and it evolved to include clinicians from the nearby hospitals, who gave lectures on their medical device/implant specialities. Drug delivery was an important part of this course.

In the 1990s I taught short courses on biomaterials, surfaces and biotechnology at the Kimberly Clark Corp. research laboratories in Neenah, Wisc. and Roswell, Georgia. I gave a short course at the Procter and Gamble Corp laboratories in Pescara, Italy. I have also given short courses at Hacettepe University in Ankara, Turkey, Malay University in Kuala Lumpur, Malaysia and Shanghai University, Shanghai, China.

In the 2000s I have continued to lecture in numerous short courses on biomaterials, drug delivery and biotechnology. Sometimes I organized the courses, and in some cases I was the only lecturer. These courses have included:

- In the early 2000s I participated for four successive years in a summer course run by Italian biomaterial scientists for European graduate students. It was held on the island of Ischia every summer. I usually gave lectures on biomaterial implants and medical devices, and controlled drug delivery systems. This course was discontinued two years ago.
- In 2005 I organized and gave all the lectures in a 3-day course on biomaterials and drug delivery at Baxter Corp. in Chicago.
- In 2006 I also participated in ACS short courses in Richmond, VA and Sonoma, CA.
- In February, 2007, I was one of three lecturers in a new course attended by 80 scientists on Biomaterials and Drug Delivery organized by the Golden Gate Polymer Forum and Abbott/Guidant Corp. and held in Santa Clara, CA.
- In November, 2007, I presented a three-day short course on biomaterials and drug delivery at the Institute of Bioengineering and Nanotechnology (IBN) in Singapore. I gave a series of similar lectures in October, 2007 at Hong Kong Polytechnic University, and a 3-day short course at the Nanyang Technological University of Singapore.
- In December, 2008, I gave 6 hours of lectures on principles of controlled drug delivery (CDD) and polymer carriers used for CDD at two sites in India: the Sree Chitra Tirunal Institute of Medical Science and Technology in Trivandrum, Kerala, India and the Manipal Institute of Regenerative Medicine in Bangalore, India.
- In March, 2009 I organized and gave a two-week short course along with Patrick Stayton at National Cheng Kung University & Hospital in Tainan, Taiwan.
- In October 2009 and again in Oct. 2010 I organized a 3-day course on Drug Delivery Systems at KIST in Seoul Korea, for undergraduate students, graduate students and postdocs from all over Korea. I gave 5 lectures in this course, along with professors from Korea. This course was sponsored by KCRS.
- In Sept. 2011, I gave a three-day short course on Biomaterials with Buddy Ratner at Donau (Danube) University, Krems, Austria.
- In October, 2011, I organized a two-day short course on Controlled Drug Delivery and presented it with Patrick Stayton and Glen Kwon at KIST in Seoul, Korea. It was sponsored by KIST and KCRS. This course has continued every year since 2011, and the most recent one was given in March, 2014.
- I have participated in a short course on Drug Delivery at the University of Aarhus in Aarhus, Denmark each year for the past 5 years. The next course will be given in June, 2014 and I will present several lectures in it.

### **Textbook**

I am one of four editors of the ***Textbook of Biomaterials Science***, which came out in 2013 with its Third Edition. The Third Edition has over 1000 pages, and has been adopted by every major college and university around the world where courses including the principles and applications of materials in medicine and biotechnology are taught. The publisher is Elsevier, and *over 11,000 copies of the Second Edition have been sold*, with 3,000 copies out on approval. All royalties go to the Society for Biomaterials to support student memberships and student participation in the Society's activities.

### **Professional Societies**

#### ***American Chemical Society***

(1958-present; now Emeritus Member of ACS)

#### ***American Institute of Chemical Engineers***

(1958-present; now Emeritus Member of AIChE)

#### ***Society for Biomaterials***

##### **Currently Emeritus Member of the Society for Biomaterials**

Charter Member (1974 - present)

Program Chairman for North America, First World Congress on Biomaterials, Vienna , Austria (1980)

Secretary-Treasurer-elect (1979-1981)

Secretary-Treasurer (1981-1982)

President-elect (1982-1983)

##### **President (1983-1984)**

US Representative on Organizing Committee for Third World Biomaterials Congress, Kyoto, Japan (1988)

##### **Founding Fellow of Biomaterial Societies International, 1990s**

#### ***Controlled Release Society***

(1982-present)

##### **Currently Emeritus Member of the Controlled Release Society**

Member Board of Governors (1991-1993)

##### **Founding Fellow of CRS, 2010**

#### ***American Institute of Medical and Biological Engineering (AIMBE)***

(1992-present) **Founding Fellow of AIMBE, 1992**

### **Membership on Editorial Boards of Journals:**

#### **Current:**

***J. Bioactive and Compatible Polymers*** (Technomic) (1995-present)

***Biomaterials, Artificial Cells, Molecular Biotech.*** (M. Dekker) (1987-present)

#### **Past:**

***Bioconjugate Chem.*** (American Chemical Society)(1998-2012)

***J. Biomaterials Sci. (Polymer Edition)*** (Brill) (1989-2012)

***Biomacromolecules*** (American Chemical Society) (2004-2012)

***J. Biomedical Materials Research*** (Wiley) (1985-2007)

***J. Controlled Release*** (Elsevier) (1990-2000)

***Applied Biochemistry & Biotechnology*** (Humana) (1986-1996)

***Biomaterials*** (Elsevier) (1986-2003)

***Biomaterials, Medical Devices, Artificial Organs*** (M. Dekker) (1971-1986)

***J. Adhesion Science and Technology*** (VNW) (1986-1994)

***Radiation Phys. & Chem.*** (Pergamon) (1976-1995)

***Trans. Amer. Soc. Artificial Internal Organs*** (ASAIO) (1986-1988)

(Biomaterials Section Editor)

***Polymer Gels and Networks*** (Elsevier) (1992-2000)

## **Publications**

### **1955**

Rossin, A.D., C.J. Billerbeck, W.S. Delicate, A.W. Wendling, A.S. Hoffman and R.C. Reid, "Graphical Method Speeds Production Scheduling of Radioisotopes", *Nucleonics*, 13, 10 (1955).

Whitehouse, D.R., F.W. Bradley, A.S. Hoffman and R.C. Reid, "How to Use Two-Phase Servo-Motors to Drive Reactor Shim Rods", *Nucleonics*, 13, 12 (1955).

### **1956**

Billerbeck, D.J., J. Farquhar, R.C. Reid, J.C. Bresee and A.S. Hoffman, "Performance of a Pulsed Spray Column", *I.E.C.*, 48, 183 (1956).

### **1959**

Hoffman, A.S., "Radiation Polymerization of Isobutylene at Low Temperature in the Liquid and Solid State", *J. Polymer Science*, 34, 241 (1959).

Hoffman, A.S., E.R. Gilliland, E.W. Merrill and W.H. Stockmayer, "Irradiation Grafting of Styrene to High Pressure and Low Pressure Polyethylene Films", *J. Polymer Science*, 34, 461 (1959).

### **1960**

Myers, A.W., C.E. Rogers, V. Stannett, M. Szwarc, G.S. Patterson, A.S. Hoffman and E.W. Merrill, "The Permeability of Some Graft Copolymers of Polyethylene to Gases and Vapors", *J. Applied Polymer Science*, 4, 11 (1960).

Burlant, W.J. and A.S. Hoffman, "Block and Graft Copolymers", Reinhold Publishing Co., New York, NY (1960).

### **1962**

Porter, R.S., A.S. Hoffman and J.F. Johnson, "Gravimetric Introduction Device for Gas Chromatography. Application to Pyrolysis Studies", *Analytical Chemistry*, 34, 9 (1962).

### **1964**

Hoffman, A.S. and R. Bacskai, "Block and Graft Copolymers", in "Copolymerization", G. Ham, Ed., Wiley-Interscience Publ. Co., New York, NY, p. 335 (1964).

### **1965**

Hoffman, A.S., V.A. Fries and P.C. Condit, "The Role of Hydrogen in Ziegler-Natta Polymerizations," *Polymer Science, Part C*, 109 (1965).

### **1966**

Hoffman, A.S. and D.E. Smith, "Electron Curing of Monomer/Polyester Mixtures", *Modern Plastics*, 43, 10 (1966).



**1967**

Bell, J.P., A.S. Michaels, A.S. Hoffman and E.A. Mason, "Transient Acceleration of Creep Rates of Polymers During High Intensity Irradiations", *Advances in Chemistry Series, No. 66*, 79, American Chemical Society, Washington, DC (1967).

Bixler, H.J., A.S. Hoffman and L.A. Spano, "New Polymeric Material Holds Key to Pervaporative Space Suit Cooling", *Space/Aeronautics, December 1967*, 197 (1967).

Hoffman, A.S., G.R. Berbeco and R. Gomes-Casseres, "Radiation-Chemical Textile Treatments for Static Dissipation and Strain Release", *Textile Veredlung, 2*, 327 (1967).

**1968**

Schneider, N.S., R.T. Traskos and A.S. Hoffman, "Characterization of Branched Polyethylene Fractions from the Elution Column", *J. Applied Polymer Science, 12*, 1567 (1968).

Stannett, V. and A.S. Hoffman, "Radiation Techniques in the Textile Industry", *Amer. Dyestuff Reporter, 57*, 25 (1968).

Traskos, R.T., N.S. Schneider and A.S. Hoffman, "Elution Column Fractionation of Branched Polyethylene", *J. Applied Polymer Science, 12*, 509 (1968).

**1969**

Hoffman, A.S., "Radiation Modification of Textiles", in "Large Radiation Sources for Industrial Processes", International Atomic Energy Agency, Vienna, Austria, (1969)  
p. 301

Hoffman, A.S., R. Gomes-Casseres and G.D. Parfitt, "Radiation Grafted Polyelectrolytes on Polymer Surfaces: Water Contact Angles as a Function of the Mobile Counter-Anion Species", *Advances in Chemistry Series, No. 91*, "Addition and Condensation Polymerization Processes", American Chemical Society, Washington, D.C., (1969) p. 542

Hoffman, A.S., R.W. Lewis and A.S. Michaels, "Properties of Polycation-Polyanion Complexes", *Polymer Preprints (ACS), 10(2)*, 916 (1969).

Hoffman, A.S., M. Modell and P. Pan, "Polyacrylic Desalination Membranes: I. Synthesis and Characterization", *J. Applied Polymer Science, 13*, 2223 (1969).

Michaels, A.S., W. Vieth, A.S. Hoffman and H. Alcalay, "Structure-Property Relationships for Liquid Transport in Modified Poly-propylene Membranes", *J. Applied Polymer Science, 13*, 577 (1969).

**1970**

Hoffman, A.S., "Radiation Grafting on Cotton Textiles and Fibers," *Isotopes and Radiation Technology, 8*, 1 (1970).

Hoffman, A.S. and G.R. Berbeco, "Hydrophilic Polymer Surfaces via Radiation-Chemical Treatments", *Textile Res. J., 40(1)*, 975 (1970).

Hoffman, A.S., J. Jameson, D.E. Smith, D.A. Trageser and W.A. Salmon, "Electron Radiation Curing of Styrene-Polyester Mixtures: Effect of Backbone Reactivity and Dose Rate", *Ind. Eng. Chem., Prod. Res. and Dev.*, 9(2), 158 (1970).

Jadwin, T.A., A.S. Hoffman and W.R. Vieth, "Crosslinked Poly(hydroxyethyl methacrylate) Membranes for Desalination by Reverse Osmosis," *J. Applied Polymer Science*, 14, 1339 (1970).

Modell, M., A.S. Hoffman and P. Pan, "Polyacrylic Desalination Membranes: II. Reverse Osmosis Performance", *J. Applied Polymer Science*, 14, 285 (1970).

### **1971**

Dietz, A.G.H. and A.S. Hoffman, "Proposed Research into Preservation of Deteriorated Stone", in "La Conservazione delle Sculture All' Aperto", Edizione Alfa, Bologna, Italy, p. 203 (1971).

Hoffman, A.S., "A Critical Evaluation of the Application of Rubber Elasticity Principles to the Study of Structural Proteins Such as Elastin", in "Biomaterials", A.L. Bement, Jr., Ed., University of Washington Press, Seattle, WA, p. 285 (1971).

Hoffman, A.S., "Electron Curing of Coatings: Present Status", *Atomic Energy Review*, 9, 2 (1971).

Hoffman, A.S., "I. Polymers in Today's Chemical Engineering Curriculum; and II. How Can Polymer Education Grow Within the Engineering Curriculum?" in "Polymers in the Engineering Curriculum", H. Markovitz, Ed., Carnegie-Mellon University Press, Pittsburgh, PA, p. 281 (1971).

Hoffman, A.S., Ed., "Solid Phase Proteins - Their Preparation, Properties and Applications", in "*Proceedings of a Conference at Battelle Seattle Research Center*," September (1971).

Hoffman, A.S., "Electron Curing of Coatings: State of the Art, 1970", *Isotopes and Radiation Technology*, 9(1), 78-92 (1971).

Hoffman, A.S. and D.P. Mukherjee, "Long Range Interactions of Cationic Sites in Elastin", *Abstracts 24th ACEMB*, 10 (1971).

Modell, M. and A.S. Hoffman, "Polyacrylic Membranes for Reverse Osmosis", *Polymer Preprints*, 12, 2 (1971).

Mukherjee, D.P. and A.S. Hoffman, "Physical and Mechanical Properties of Elastin", in "Physical Properties of Skin, Part I", H.R. Elden, Ed., John Wiley and Sons Publ. Co., New York, NY (1971) p. 219.

### **1972**

Hoffman, A.S. and C. Harris, "Radiation-Grafted Hydrogels on Silicone Rubber Surfaces - A New Biomaterial", *ACS Polymer Preprints*, 13(2), 740 (1972).

Hoffman, A.S. and W.G. Kraft, "Radiation-Grafted Hydrogels on Polyurethane Surfaces - A New Biomaterial," *ACS Polymer Preprints*, 13(2), 723 (1972).

Hoffman, A.S., G. Schmer, C. Harris and W.G. Kraft, "Covalent Binding of Biomolecules to Radiation-Grafted Hydrogels on Inert Polymer Surfaces", *Trans. American Society for Artificial Internal Organs*, 18, 10 (1972).

**1973**

Hoffman, A.S., L.A. Grande, P. Gibson, J.B. Park, C.H. Daly, P. Bornstein and R. Ross, "Preliminary Studies on Mechanochemical Structure Relationships in Connective Tissues using Enzymolysis Techniques", in "Perspectives in Biomedical Engineering", R.M. Kenedi, Ed., University Park Press, London, England (1973) p. 173 .

Hoffman, A.S., J.B. Park and J. Abrahamson, "Sequential Enzymolysis of Ligament and Resultant Stress-Strain Behavior", *Biomaterials, Medical Devices and Artificial Organs*, 1(3), 453 (1973).

Hoffman, A.S. and G. Schmer, "New Approaches to Non-Thrombogenic Materials", in "Coagulation: Current Research and Clinical Applications", G. Schmer, Ed., Academic Press, New York, NY (1973) p. 201 .

Hoffman, A.S. and G. Schmer, "New-Biocompatible and Biofunctional Materials via Radiation-Chemical Synthesis", *Paroi Arterielle (Arterial Wall)*, 1, 95 (1973).

Ratner, B.D. and A.S. Hoffman, "Radiation Grafted Hydrogels on Silicone Rubber as New Biomaterials", *ACS Coatings and Plastics Preprints*, 33, 386 (1973). Also in "Biomedical Applications of Polymers", H.P. Gregor, Ed., Plenum Publ. Corp., New York, NY, p. 159 (1974).

**1974**

Hoffman, A.S., "Principles Governing Biomolecule Interactions at Foreign Interfaces", *J. Biomedical Materials, Research Symp. No. 5 (Part 1)*, 77 (1974).

Mate, T.P., T.A. Horbett, A.S. Hoffman, and B.C. Ratner, "Covalent coupling of Small Molecules and Proteins to Poly(2-Hydroxyethyl Methacrylate-Methacrylic Acid) Hydrogels", *Enzyme Engineering*, 2, 137-139 (1974).

Hoffman, S.C., H.F. Stegall and A.S. Hoffman, "Innovation - The Individual and the University Environment", *The Trend in Engineering*, 26(2), 38 (1974).

Mukherjee, D.P., A.S. Hoffman and C. Franzblau, "The Physical Properties and Molecular Structure of *Ligamentum Nuchae* Elastin", *Biopolymers*, 13, 2447 (1974).

Ratner, B.D. and A.S. Hoffman, "The Effect of Cupric Ion on the Radiation Grafting of N-Vinyl-2-Pyrrolidone and Other Hydrophilic Monomers onto Silicone Rubber", *J. Applied Polymer Science*, 18, 3183 (1974).

Hoffman, A.S., G. Schmer, T.A. Horbett, B.D. Ratner, L.N. Teng, C. Harris, W.G. Kraft, B.N.L. Khaw, T.T. Ling and T.P. Mate, "Preparation and Application of Radiation-Grafted Hydrogels as Biomaterials", *ACS Coatings and Plastics Preprints*, 34, 568 (1974). Also published in "The Permeability of Plastic Films and Coatings to Gases, Vapors and Liquids", H.P. Hopfenburg, Ed., Plenum Press, New York, NY (1975) p. 441.

**1975**

Hoffman, A.S., "Applied Industrial Radiation Chemistry of Monomers and Polymers", in "Radiation Research", O.F. Nygaard, H.I. Adler and W.K. Sinclair, Eds., Academic Press, New York, NY (1975) p. 65 .

Hoffman, A.S., "Hydrogels--A Broad Class of Biomaterials", in "Polymers in Medicine and Surgery", R.L. Kronenthal, Z. Oser and E. Martin, Eds., Plenum Press, New York, NY, p. 33 (1975).

Horbett, T.A. and A.S. Hoffman, "Bovine Plasma Protein Adsorption to Radiation Grafted Hydrogels", *ACS Advances in Chemistry Series*, No. 145, "Applied Chemistry at Protein Interfaces", p. 230 (1975).

Mate, T.P., T.A. Horbett, A.S. Hoffman and B.D. Ratner, "pH Effects in the Covalent Coupling of Small Molecules and Proteins to Poly(HEMA-methacrylic acid) Hydrogels", in "Enzyme Engineering", Pye and Wingard, Eds., Plenum Press, New York, NY (1975) p. 137 .

Ratner, B.D., A.S. Hoffman and J.D. Whiffen, "Blood Compatibility of Radiation Grafted Hydrogels", *Biomaterials, Medical Devices and Artificial Organs*, 3(1), 115 (1975).

Ratner, B.D., T.A. Horbett and A.S. Hoffman, "Cell Adhesion to Polymeric Materials: Implications with Respect to Biocompatibility", *J. Biomedical Materials Research*, 9(5), 407 (1975).

Hoffman, A.S. and B.D. Ratner, "Synthetic Hydrogels for Biomedical Applications -- A Review", *ACS Polymer Preprints*, 16(2), 272 (1975). Also in *ACS Symposium Series*, No. 31, 1 (1976).

Khaw, B., B.D. Ratner and A.S. Hoffman, "The Thermodynamics of Water Sorption in Radiation Grafted Hydrogels", *ACS Polymer Preprints*, 16(2), 446 (1975). Also in *ACS Symposium Series*, No. 31, 295 (1976).

Sasaki, T., B.D. Ratner and A.S. Hoffman, "Radiation-Induced Co-Graft Polymerization of 2-Hydroxyethyl Methacrylate and Ethyl Methacrylate onto Silicone Rubber Films", *ACS Polymer Preprints*, 16(2), 446 (1975). Also in *ACS Symposium Series*, No. 31, 283 (1976).

Venkataraman, S., T.A. Horbett and A.S. Hoffman, "The Reactivity of  $\alpha$ -Chymotrypsin Immobilized on Radiation-Grafted Hydrogel Surfaces", *ACS Polymer Preprints*, 16(2), 197 (1975). Also in *J. Biomedical Materials Research*, 8, 111 (1977).

### 1976

Ratner, B.D. and A.S. Hoffman, "Synthetic Hydrogels for Biomedical Applications", *ACS Symposium Series*, 31, "Hydrogels for Medical and Related Applications", 1-36 (1976).

Burillo, V.G., S.M.G. Albarran, A.J.S. Mauricio, V.V.M. Loyola and A.S. Hoffman, "Reduced Peeling Losses in Mexican Pine after Gamma Irradiation", *J. Radiation Curing*, 3(4), 18 (1976).

Hoffman, A.S., "Biomatériaux", *Symbioses*, 8, 3 (1976).

Park, J.B., C.H. Daly and A.S. Hoffman, "The Contribution of Collagen to the Mechanical Response of Canine Artery at Low Strains", *Front. Matrix Biol.*, 3, 218 (1976).

Weathersby, P.K., T.A. Horbett and A.S. Hoffman, "A New Method for Analysis of the Adsorbed Plasma Protein Layer on Biomaterial Surfaces", *Trans. Amer. Soc. Artif. Int. Organs*, 22, 242 (1976).

**1977**

Hoffman, A.S., "Surface Modifications of Polymers for Biomedical Applications", *Proceedings of the International Conference on Polymer Processing*, "Science and Technology of Polymer Processing", N.P. Suh and H-H. Sung, Eds., p. 200-261 (1977).

Hoffman, A.S., and J.B. Park, "Sequential Enzymolysis of Human Aorta and Resultant Stress-Strain Behavior", *Biomat., Med., Dev., & Art. Org.*, 5(2), 121-145 (1977).

Harker, L.A., S.R. Hanson and A.S. Hoffman, "Platelet Kinetic Evaluation of Prosthetic Material *in vivo*", *Ann. N.Y. Academy of Sciences*, 283, 317 (1977).

Hoffman, A.S., "Applications of Radiation Processing in Biomedical Engineering", *Radiation Physics and Chemistry*, 9, 207 (1977).

Hoffman, A.S., "Medical Applications of Polymeric Fibers", *J. Applied Polymer Science, Applied Polymer Symposium*, 31, 313 (1977).

Hoffman, A.S., T.A. Horbett and B.D. Ratner, "Interactions of Blood and Blood Components", *Ann. N.Y. Academy of Sciences*, 283, 372 (1977).

Horbett, T.A., P.K. Weathersby and A.S. Hoffman, "The Preferential Adsorption of Hemoglobin to Polyethylene", *J. Bioengineering*, 1, 61 (1977).

Ratner, B.D., T. Balisky and A.S. Hoffman, "A Flow Grafting Apparatus for Modifying the Luminal Surface of Polymeric Tubing", *J. Bioengineering*, 1, 115 (1977).

Ratner, B.D., P.K. Weathersby, A.S. Hoffman, M.A. Kelly and L. Scharpen, "Radiation Grafted Hydrogels for Biomaterial Applications as Studied by the ESCA Technique", *J. Applied Polymer Science*, 22, 643 (1977).

Venkataraman, S., T.A. Horbett and A.S. Hoffman, "The Kinetic Behavior of a-Chymotrypsin Immobilized Inside Hydrogel Grafted Tubes", *J. Molecular Catalysis*, 2, 273 (1977).

Weathersby, P.K., T.A. Horbett and A.S. Hoffman, "Fibrinogen Adsorption to Surfaces of Varying Hydrophilicity", *J. Bioengineering*, 1(4), 395 (1977).

Weathersby, P.K., T.A. Horbett and A.S. Hoffman, "Solution Stability of Bovine Fibrinogen", *Thrombosis Research*, 10, 245 (1977).

Weathersby, P.K., T.A. Horbett, A.S. Hoffman and M.A. Kelly, "Surface Analysis of Methacrylate Graft Copolymers Varying in Hydrophilicity", *J. Bioengineering*, 1(4), 381 (1977).

**1978**

Horbett, T.A., P.K. Weathersby and A.S. Hoffman, "Hemoglobin Adsorption to Three Polymer Surfaces", *Thrombosis Research*, 12, 319 (1978).

Park, J.B. and A.S. Hoffman, "Interaction of Collagen and Smooth Muscle Cells in Aortic Biomechanics", *Ann. Biomed. Eng.*, 6, 167 (1978).

Ratner, B.D., A.S. Hoffman and J.D. Whiffen, "The Thrombogenicity of Radiation Grafted Polymers as Measured by the Vena Cava Ring Test", *J. Bioengineering*, 2, 313 (1978).

Ratner, B.D., L.H. Scharpen, J.J. Rosen and A.S. Hoffman, "Cleaning Glass Surfaces: The Effectiveness of Various Methods as Determined by the ESCA Technique", in "Proceedings of the 4th International Symposium on Surface Contamination", ICCCS Publ., Washington, DC, p. 267 (1978). Also in "Surface Contaminants", Vol. 2, Plenum Press, New York, NY (1979) p. 669.

### **1979**

Hanson, S.R., Harker, L.A., Ratner, B.D. and A.S. Hoffman, "Factors Influencing Platelet Consumption by Polyacrylamide Hydrogels" Annl. Biomed. Engr., 7, 357-367 (1979).

Hoffman, A.S., "Surface Modifications of Polymers for Biomedical Applications", in "Science and Technology of Polymer Processing", N.P. Suh and N.H. Sung, Eds., MIT Press, Cambridge, MA (1979) p. 200.

Hoffman, A.S. and B.D. Ratner, "Radiation Grafting of Acrylamide to Polymer Substrates in the Presence of Cupric Ion: I. A Preliminary Study", Radiation Physics and Chemistry, 14, 831 (1979).

Hoffman, A.S. and B.D. Ratner, "Some Unusual Effects in the Radiation Grafting of Acrylamide to Polymer Substrates", ACS Polymer Preprints, 20, 423 (1979).

Hoffman, A.S., B.D. Ratner, Y.C. Ko and T.A. Horbett, "Estimation of Surface Energy Components and Their Potential Relevance to Biological Interactions", in "Proceedings of NSF Workshop on Interfacial Phenomena", J.C. Berg, Ed., University of Washington Press, Seattle, WA, p. 445 (1979).

Ratner, B.D. and A.S. Hoffman, "Surface Characterization of Hydrophilic-Hydrophobic Copolymer Model Systems", ACS Organic Coatings and Plastics Chemistry Preprints, 40, 714 (1979).

Ratner, B.D., A.S. Hoffman, S.R. Hanson, L.A. Harker and J.D. Whiffen, "Blood Compatibility - Water Content Relationships for Radiation-Grafted Hydrogels", J. Polymer Science, Symposium No. 66, 17, 363 (1979).

Ratner, B.D., Rosen, J.J., Hoffman, A.S., Scharpen, L.H., "An ESCA Study of Surface Contaminants on Glass Substrates For Cell Adhesion" Surf. Contam., 2, (1979).

### **1980**

Hanson, S.R., L.A. Harker, B.D. Ratner and A.S. Hoffman, "In vivo Evaluation of Artificial Surfaces with a Nonhuman Primate Model of Arterial Thrombosis", J. Lab. Clin. Med., 95, 289 (1980).

Hoffman, A.S., "Comparison of Enzyme Probe Techniques Used to Investigate Tissue Biomechanics *in vitro*", Biorheology, 17, 45 (1980).

Hoffman, A.S. and C.H. Daly, "A Commentary on the Use of Enzyme Probes to Elucidate the Contributions of Individual Components to Soft Tissue Biomechanics *in vitro*", in "Biology of Collagen", A. Viidik, Ed., Academic Press, London, England, p. 297 (1980).

Ratner, B.D. and A.S. Hoffman, "Surface Characterization of Hydrophilic-Hydrophobic Copolymer Model Systems: I. A Preliminary Study", in "Adhesion and Adsorption of Polymers", L.H. Lee, Ed., Polymer Science and Technology Series, Plenum Press, New York, NY, p. 691 (1980).

Ratner, B.D. and A.S. Hoffman, "Surface Grafted Polymers for Biomedical Applications", in "Synthetic Biomedical Polymers: Concepts and Applications", W.J. Robinson and M.Szycher, Eds., Technomic Publishing Co., Westport, CT (1980) p. 133.

### **1981**

Hoffman, A.S., "Radiation Processing in Biomaterials -- A Review", *Radiation Physics and Chemistry*, 18(1), 323 (1981).

Hoffman, A.S., "Radiation Processing Treatments To Prepare Novel Biomaterials", *Radiat. Chem., (Japan)*, 16(31), 12-28 (1981).

Hoffman, A.S., "A Review of the Use of Radiation Plus Chemical and Biochemical Processing Treatments to Prepare Novel Biomaterials", *Radiat. Phys. Chem.*, 18(1-2), 323-342 (1981).

Hoffman, A. S., "Use of Radiation Technology in Preparation of Materials for Bioengineering and Medical Science", *Int'l Atomic Agency* (1981).

Hoffman, A.S., T.J. Hale, J.A.S. Nightingale and S.A. Halbert, "Use of Methyl Cyanoacrylate in Female Sterilization", in "*Proceedings of the 2nd World Congress of Chemical Engineering, Montreal, Canada, October 1981, Vol. III*", p. 410 (1981).

Hoffman, A.S., S.R. Hanson, L.A. Harker, T.A. Horbett, B.D. Ratner and L.O. Reynolds, "The Interaction of Silastic and Polyacrylamide-Silastic Surfaces with Blood", *Artificial Organs*, 5(Suppl.), 540 (1981).

Ko, Y.C., B.D. Ratner and A.S. Hoffman, "Characterizations of Hydrophilic-Hydrophobic Polymeric Surfaces by Contact Angle Measurements", *J. Colloid Interfacial Science*, 82, 25 (1981).

### **1982**

Hanson, S.R., L.A. Harker, B.D. Ratner and A.S. Hoffman, "Evaluation of Artificial Surfaces Using Baboon Arteriovenous Shunt Model", in "Biomaterials, 1980", G. Winter, D. Gibbons and H. Plenk, Eds., J. Wiley and Sons, London, p. 519 (1982).

Hoffman, A.S., "Academic Focus: The Biomaterials Program at the University of Washington (Seattle)", *Journal of Biomedical Materials Research*, 16, 735-740 (1982).

Hoffman, A.S., "Blood-Biomaterial Interactions: An Overview", in "Biomaterials: Interfacial Phenomena and Applications", *ACS Advances in Chemistry Series, No. 199*, S.L. Cooper, N.A. Peppas, A.S. Hoffman and B.D. Ratner, Eds., Maple Press Co., York, PA, p. 3 (1982).

Hoffman, A.S., "Synthetic Polymer Biomaterials-A Review", in "IUPAC - Macromolecules", H. Benoit and P. Rempp, Eds., Pergamon Press, London, England, p. 321 (1982).

Hoffman, A.S., "The Academics of Biomaterials", Kobunshi/High Polymers, Japan. *The Society of Polymer Science, Japan. Vol. 31*. (September 1982).

Hoffman, A.S., "Use of Radiation Technology in Preparation of Materials for Bioengineering and Medical Science", in "Industrial Application of Radioisotopes and Radiation Technology", *Proceedings of a Conference in Grenoble, France, Sept. 28-Oct. 2, 1981, I.A.E.A., Vienna, Austria*, (1982) p. 279.

Hoffman, A.S., S.R. Hanson, L.A. Harker, B.D. Ratner and L.O. Reynolds, "Thrombotic Events on Grafted Polyacrylamide-Silastic Surfaces as Studied in a Baboon", in "Biomaterials: Interfacial Phenomena and Applications", *ACS Advances in Chemistry Series, No. 199*, S.L. Cooper, N.A. Peppas, A.S. Hoffman and B.D. Ratner, Eds., Maple Press Co., York, PA, (1982) p. 59.

### **1983**

Hoffman, A.S., D. Cohn, S.R. Hanson, L.A. Harker, T.A. Horbett, B.D. Ratner and L.O. Reynolds, "Application of Radiation-Grafted Hydrogels as Blood-Contacting Biomaterials", *Radiation Physics and Chemistry, 267* (1983).

Keller, T.S., A.S. Hoffman, B.D. Ratner and B.J. McElroy, "Chemical Modification of Kevlar Surfaces for Improved Adhesion to Epoxy Resin Matrices: I. Surface Characterization", in "Physicochemical Aspects of Polymer Surfaces", Vol. 2, K.L. Mittal, Ed., Plenum Press, New York, NY, p. 861 (1983).

### **1984**

Cohn, D., A.S. Hoffman, and B.D. Ratner, "Radiation-Grafted Polymers for Biomaterial Applications. I. 2-Hydroxyethyl Methacrylate/Ethyl Methacrylate Grafting onto Low Density Polyethylene Films", *Journal of Applied Polymer Science, 29*, 2645-2663 (1984).

Garfinkle, A.M., A.S. Hoffman, B.D. Ratner, L.O. Reynolds, and S.R. Hanson, "Effects of a Tetrafluoroethylene Glow Discharge on Patency of Small Diameter Vascular Grafts", *Transactions ASAIO, 30*, 432-439 (1984).

Hoffman, A.S., "Applications of Polymers in Biotechnology", *Pure and Appl. Chem.*, 56 (10) 1329-1334 (1984).

Hoffman, A.S., "Industrial Radiation Processing--Principles and Applications, 1983", in "*Proceedings of 1983 Annual Meeting of the Nordic Radiation Research Society, Helsinki, Finland, September, 1983*", (published in 1984).

Hoffman, A.S., "Ionizing Radiation and Gas Plasma (or Glow) Discharge Treatments for Preparation of Novel Polymeric Biomaterials", in "Polymers in Medicine", *Advances in Polymer Science, No. 57*, K. Dusek, Ed., Springer-Verlag, Berlin, F.R.G. (1984).

Hoffman, A.S., "Polymeric Biomaterials in Medicine", in "The Past, Present and Future of Artificial Organs", Piskin, E., T. M.S. Chang, Eds., International Symposium on Hemoperfusion and Artificial Organs, Ankara, Turkey (September 10-11, p. 31-51, 1984).

Hoffman, A.S., "Polymeric Biomaterials--Present and Future Applications, 1984" (Presented at the first Kyoto International Symposium on Biomedical Materials, Research Institute for Medical Polymers and Biomaterials, Kyoto University, Kyoto, Japan, November 12, 1983.) *Symposium Proceedings* (1984).

Hoffman, A.S., "Synthetic Polymeric Biomaterials", in "Polymeric Materials and Artificial Organs", C. Gebelein, Ed., *ACS Symposium Series, 256*, 13-29 (1984).

Hoffman, A.S. *et al.*, "Unusual Biological Interactions at Biomaterial Interfaces: Influence of Molecular Surface Character." *Progr. in Artif. Org. 1983, Vol. 2*, K. Atsumi, M. Maebawa and K. Ota, Eds., *ISAO Press No. 204*, Cleveland, OH (1984).



Hoffman, A.S. and T. Tsuruta, "Biomaterials Around the World: Review of ISAO Symposium", *Progr. in Artif. Org.* 1983, Vol. 2, K. Atsumi, M. MaeBawa and K. Ota, Eds., ISAO Press No. 204, Cleveland, OH (1984).

Nightingale, J.A., A.S. Hoffman, S.A. Halbert, and R.G. Buckles, "Use of Methyl Cyanocrylate (MCA) as a Sclerosing Agent in Female Sterilization: Effect of Inhibitors and Radioopaque Additives on MCA Polymerization *In vitro* and on Oviduct Occlusion *In vivo* in Rabbits", "Polymers as Biomaterials", S. Shalaby, A.S. Hoffman, B.D. Ratner and T.A. Horbett, Eds., Plenum Press (1984) p. 375-386.

### **1985**

Gombotz, W.R., A.S. Hoffman, G. Schmer and S. Uenoyama, "Immobilized Enzymes in Blood Plasma Exchangers via Radiation Grafting", *Radiat. Phys. Chem.*, 25, 549-556 (1985).

Gombotz, W.R., A.S. Hoffman, G. Schmer and S. Uenoyama, "The Immobilization of L-Asparaginase on Porous Hollow Fiber Plasma Filters", *J. Contr. Rel.*, 2, 375-383 (1985).

### **1986**

Dong, L.C. and A.S. Hoffman, "A New Method for Immobilization of Biomolecules Using Preirradiation Grafting at Low Temperature", *Radiat. Phys. Chem.*, 28, 177-182 (1986).

Dong, L.C. and A.S. Hoffman, "Thermally Reversible Hydrogels: III. Immobilization of Enzymes for Feedback Reaction Control", *J. Contr. Rel.*, 4, 223-227 (1986).

Gombotz, W.R. and A.S. Hoffman, "Immobilization of Biomolecules and Cells on and within Synthetic Polymeric Hydrogels", in "Hydrogels in Medicine and Pharmacy", Vol. I, N.A. Peppas, Ed., CRS Press, Boca Raton, FL, p. 95-126 (1986).

Hoffman, A.S., "A General Classification Scheme for Hydrophilic and Hydrophobic Biomaterial Surfaces", *J. Biomed. Mater. Res.*, 20(ix) (1986).

Hoffman, A.S., "Applications of Synthetic Polymeric Biomaterials in Medicine and Biotechnology", in "Polymeric Biomaterials", E. Piskin and A.S. Hoffman, Eds., M. Nijhoff Publ., Dordrecht, Netherlands, p. 1-14 (1986).

Piskin, E. and A.S. Hoffman, Eds., "Polymeric Biomaterials", M. Nijhoff Publ., Dordrecht, Netherlands (1986).

Hoffman, A.S., "Biomaterials and their Application in the Artificial Heart", Presented at the Second World Symposium on the Artificial Heart, July 13-15, 1984, Berlin; "Proceedings of the Second World Symposium on the Artificial Heart", E.S. Bucherl, Ed., Vieweg Publ., Berlin, F.R.G., p. 7-58 (1986).

Hoffman, A.S., "Materials for Biotech", *ChemTech*, 16, 426-432 (1986).

Hoffman, A.S., *et. al.*, "Novel Application of Polymers in Bioseparations and Diagnostics", in "Proceedings of Polymers in Medicine and Surgery V", *Holland*, 37(1), 2 (September 1986).

Hoffman, A.S., A. Afrassiabi and L.C. Dong, "Delivery and Removal of Substances to and from Surrounding Solutions Using Thermally Reversible Hydrogels", *Macromolecular Preprints IUPAC Macro '86*, Oxford, England, Sept. 16-19, 1986, 63-64 (1986).

Hoffman, A.S., A. Afrassibi and L.C. Dong, "Thermally Reversible Hydrogels: II. Delivery and Selective Removal of Substances in Aqueous Solutions", *J. Contr. Rel.*, **4**, 213-222 (1986).

Hoffman, A.S., W.R. Gombotz, S. Uenoyama, L.C. Dong and G. Schmer, "Immobilization of Enzymes and Antibodies to Radiation Grafted Polymers for Therapeutic and Diagnostic Applications", *Radiat. Phys. Chem.*, **27**, 265-273 (1986).

Hoffman, A.S., B.D. Ratner, A.M. Garfinkle, L.O. Reynolds, T.A. Horbett and S.R. Hanson, "A New Plasma Discharge Treatment for Cardiovascular Implants", in "Biomedical Materials", J.M. Williams, M.F. Nichols and W. Zingg, Eds., Mater. Res. Soc., Pittsb., PA, p. 3-17 (1986).

Hoffman, A.S., B.D. Ratner, A.M. Garfinkle, L.O. Reynolds, T.A. Horbett and S.R. Hanson, "The Importance of Vascular Graft Surface Composition as Demonstrated by a New Gas Discharge Treatment for Small Diameter Grafts", in "Vascular Graft Update", H. Kambic, A. Kantrowitz, P. Sung, Eds. ASTM Publ., Phila., PA, p. 137-155 (1986).

Hoffman, A.S., B.D. Ratner, A.M. Garfinkle, L.O. Reynolds, T.A. Horbett and S.R. Hanson, "The Small Diameter Vascular Graft - A Biomaterials Challenge", in "Polymers in Medicine", E. Chiellini, P. Giusti, C. Migliaresi and L. Nicolais, Eds., Plenum Press, p. 157-173 (1986).

Horbett, T.A., C.M. Cheng, B.D. Ratner, S.R. Hanson and A.S. Hoffman, "The Kinetics of Baboon Fibrinogen Absorption to Polymers", *J. Biomed. Mater. Res.*, **20**, 739-772 (1986).

Sun, Y.H., W.R. Gombotz and A.S. Hoffman, "Synthesis and Characterization of Non-Fouling Polymer Surfaces: I. Radiation Grafting of Hydroxyethyl Methacrylate and Polyethylene Glycol Methacrylate onto Silastic Film", *J. Bioactive and Biocompat. Pol.*, **1**, 316-334 (1986).

### **1987**

Dong, L.C. and A.S. Hoffman, "Thermally Reversible Hydrogels: Swelling Characteristics and Activities of Copoly(NIPAAm-AAm) Gels Containing Immobilized Asparaginase", in *ACS Symposium Series*, **350**, "Reversible Polymeric Gels and Related Systems", P. Russo, Ed., ACS, Washington, D.C., p. 236-244 (1987)

Afrassibi, A., A.S. Hoffman and L. Cadwell, "Effect of Temperature on the Release Rate of Biomolecules from Thermally Reversible Hydrogels", *J. Membr. Sci.*, **33**, 191-200 (1987).

Auditore-Hargreaves, K., R.L. Houghton, N. Monji, J.H. Priest, A.S. Hoffman and R.C. Nowinski, "Phase Separation Immunoassays", *Clin. Chem.*, **33**, 1509-1516 (1987).

Cohn, D., A.S. Hoffman and B.D. Ratner, "Radiation Grafted Polymers for Biomedical Applications: II. Structure of HEMA and EMA Grafted Networks", *J. Appl. Polymer Sci.*, **33**, 1 (1987).

Cole, C.A., S.M. Schreiner, J.H. Priest, N. Monji and A.S. Hoffman, "N-Isopropyl Acrylamide and N-Acryl Succinimide Copolymers: A Thermally Reversible Water Soluble Activated Polymer for Protein Conjugation", in *ACS Symposium Series*, **350**, "Reversible Polymeric Gels and Related Systems", P. Russo, Ed., ACS, Washington, D.C., p. 245-254 (1987).

Gombotz, W.R. and A.S. Hoffman, "Gas Discharge Techniques for Modification of Biomaterials", Chapter in "Critical Reviews in Biocompatibility", David Williams, Ed., *CRC Press*, Boca Raton, Florida, **4(1)**, 1-42 (1987).

Hoffman, A.S., "Applications of Thermally Reversible Polymers and Hydrogels in Therapeutics and Diagnostics", *J. Contr. Rel.*, **6**, 297-305 (1987).

Hoffman, A.S., "Modification of Material Surfaces to Affect How They Interact with Blood", in "Blood in Contact with Natural and Artificial Surfaces", E. Leonard, L. Vroman and V. Turitto, Eds., *Ann. N.Y. Acad. Sci.*, 516, 96-101 (1987).

Monji, N. and A.S. Hoffman, "A Novel Immunoassay System and Bioseparation Process Based on Thermal Phase Separating Polymers", *Appl. Biochem. and Biotechnology*, 14, 107-120 (1987).

Priest, J.H., S.L. Murray, R.G. Nelson and A.S. Hoffman, "LCSTs of Aqueous Copolymers of N-Isopropyl Acrylamide and other N-Substituted Acrylamides", in *ACS Symposium Series*, 350, "Reversible Polymeric Gels and Related Systems", P. Russo, Ed., ACS, Washington, DC, p. 255-264 (1987).

Shoemaker, S., A.S. Hoffman and J.H. Priest, "Synthesis of Vinyl Monomer-Enzyme Conjugates", *Appl. Biochem. and Biotechnology*, 15, 11 (1987).

Sun, Y., A.S. Hoffman and W.R. Gombotz, "Non-Fouling Biomaterial Surfaces: II. Protein Adsorption on Radiation Grafted Polyethylene Glycol Methacrylate Copolymers." *ACS Polymer Prepr.*, 28(1), 292-294 (1987).

Kiaei, D., A.S. Hoffman, B.D. Ratner and T.A. Horbett, "Interaction of Blood with Gas Discharge-Treated Vascular Grafts", *A.C.S. Preprints, Polymeric Mtls. Sci. and Eng.*, 56, 710 (1987). [Also published in "Plasma Polymerization and Plasma Treatment of Polymers", H. Yasuda and P. Kramer, Eds., *J. Appl. Polymer Sci. Symposium Series*, 42(2), 269 (1988).]

Gombotz, W.R. and A.S. Hoffman, "Functionalization of Polymeric Films by Plasma Polymerization of Allyl Alcohol and Allylamine", *A.C.S. Preprints, Polymeric Mtls. Sci. and Eng.*, 56, 720 (1987). [Also published in "Plasma Polymerization and Plasma Treatment of Polymers", H. Yasuda and P. Kramer, Eds., *Appl. Polymer Sci. Symposium*, 42, 285 (1988).]

Hoffman, A.S., "Biomedical Applications of Plasma Gas Discharge Processes", *A.C.S. Preprints, Polymeric Mtls. Sci. and Eng.*, 56, 699 (1987). Also published in "Plasma Polymerization and Plasma Treatment of Polymers", H. Yasuda and P. Kramer, Eds., *J. Appl. Polymer Sci. Symposium*, 42, 251 (1988).

## 1988

Hoffman, A.S., "Combining Novel Biomolecules and Stimuli-Sensitive Biomaterials into New Recognition-Response Biomaterial Systems", *Artif. Org.*, 12, 504-505 (1988).

Hoffman, A.S., "Future Development of Biomaterials: Demand and Potential", *Artif. Org.*, 12, 497-503 (1988).

Hoffman, A.S., "Thermally Reversible Hydrogels Containing Biologically Active Species", in "Polymers in Medicine III", C. Migliaresi, et. al., Ed., Elsevier Science Publishers B.V., Amsterdam (1988) p. 161-167.

Horbett, T.A., J.J. Waldburger, B.D. Ratner and A.S. Hoffman, "Cell Adhesion to a Series of Hydrophilic-Hydrophobic Copolymers Studied with a Spinning Disc Apparatus", *J. Biomed. Mater. Res.*, 22, 383-404 (1988).

Uenoyama, S. and A.S. Hoffman, "Synthesis and Characterization of AAm/NIPAAm Grafts on Silicone Rubber Substrates", *Radiat. Phys. and Chem.*, 32, 605-608 (1988).

Park, T.G. and A.S. Hoffman, "Effect of Temperature Cycling on the Activity and Productivity of Immobilized b-Galactosidase in a Thermally Reversible Hydrogel Bead Reactor", *Appl. Biochem. and Biotech.*, 19, 1-9 (1988).

Kugo, K., Grashin, J. and Hoffman, A. S., "Thermally Reversible Gels based on Poly(vinyl alcohol)", in *POVAL Com. Report No. 83*, Kobe, Japan (1988).

#### **1989**

Gombotz, W. R., Wang, G. and Hoffman, A.S., "Immobilization of Poly(ethylene Oxide) on Poly(ethylene Terephthalate) Using a Plasma Polymerization Process", *J. Appl. Polymer Sci.*, 37, 91-107 (1989).

Park, T.G. and A.S. Hoffman, "Immobilization of *A. Simplex* Cells in Thermally Reversible Hydrogels III: Comparative Effects of Organic Solvent and Polymeric Surfactant on Steroid Conversion", *Biotech Letters*, 11, 17-22 (1989).

#### **1990**

Park, T.G. and A.S. Hoffman, "Immobilization and Characterization of b-Galactosidase in Thermally Reversible Hydrogel Beads", *J. Biomed. Mater. Res.*, 24, 21-38 (1990).

Park, T.G. and A.S. Hoffman, "Immobilization of *A. Simplex* Cells in a Thermally-Reversible Hydrogel: Effect of Temperature Cycling on Steroid Conversion", *Biotech. Bioeng.*, 35, 152-159 (1990).

Dong, L.C. and A.S. Hoffman, "Synthesis and Application of Thermally-Reversible Heterogels for Drug Delivery", *J. Contr. Release*, 13, 21-32 (1990). (1989 PhD Award Paper of Controlled Release Society)

Castner, D.G., B.D. Ratner and A.S. Hoffman, "Surface Characterization of a Series of Polyurethanes by XPS and Contact Angle Methods", *J. Biomater. Sci., Polymer Ed.*, 1, 191-206 (1990).

Chen, J.P., H.J. Yang and A.S. Hoffman, "Polymer-Protein Conjugates. I. Effect of Protein Conjugation on the Cloud Point of Poly(N-isopropyl Acrylamide)", *Biomaterials*, 11, 625-630 (1990).

Chen, J.P. and A.S. Hoffman, "Polymer-Protein Conjugates. II. Affinity Precipitation of Human IgG by Poly(N-isopropyl Acrylamide) - Protein A Conjugates", *Biomaterials*, 11, 631-634 (1990).

Monji, N., C-A. Cole, M. Tam, L. Goldstein, R.C. Nowinski and A.S. Hoffman, "Application of a Thermally-Reversible Polymer-Antibody Conjugate in a Novel Membrane-Based Immunoassay", *Biochem. and Biophys. Res. Comm.*, 172, 652-660 (1990).

Pettit, D., T.A. Horbett, A.S. Hoffman and K.Y. Chan, "Quantitation of Rabbit Corneal Epithelial Cell Outgrowth on Polymeric Substrates *in vitro*", *Invest. Ophth. Visual Sci.*, 31, 2269-2277 (1990).

Yang, H.J., C.A. Cole, N. Monji and A.S. Hoffman, "Preparation of a Thermally Phase-Separating Copolymer with a Controlled Number of Active Ester Groups per Polymer Chain", *J. Polymer Sci. A., Polymer Chem.*, 28, 219-226 (1990).

Park, T.G. and A.S. Hoffman, "Immobilized Biocatalysts in Reversible Hydrogels", in "Enzyme Engineering X", A. Tanaka, Ed., Ann. N.Y. Acad. Sci., 613, 588-593 (1990).

Bohnert, J. L., B.C. Fowler, T.A. Horbett and A.S. Hoffman, "Plasma Gas Discharge-Deposited Fluorocarbon Polymers Exhibit Reduced Elutability of Adsorbed Albumin and Fibrinogen", J. Biomats. Sci. Polymer Edn., 1, 279-297 (1990).

Hoffman, A.S. "Adsorption and Immobilization of Proteins on Gas Discharge-Treated Surfaces", J. Appl. Poly. Sci., Appl. Pol. Symp., 46, 341-359 (1990).

Hoffman, A.S., "Bioreactors in Medicine", Biomtls., Artif Cells, Artif Org., 18, 523-528 (1990).

### 1991

Hoffman, A.S., "Conventional and Environmentally Sensitive Hydrogels for Medical and Industrial Uses", in "Polymer Gels", D. DeRossi, et. al., Eds., Plenum Press, N.Y, p. 289-297 (1991).

Dong, L.C. and A.S. Hoffman, "A Novel Approach for Preparation of pH- and Temperature-Sensitive Hydrogels for Enteric Drug Delivery", J. Contr. Release, 15, 141-152 (1991).

Safranj, A.,D. Kiaei and A. S. Hoffman, "Antibody Immobilization onto Glow-Discharge-Treated Polymers", Biotech. Progr., 7, 173 (1991).

Hoffman, A.S. "Environmentally Sensitive Polymers and Hydrogels", MRS (Materials Research Society) Bulletin, XVI, (9), 42-47 (1991).

Gombotz, W.R., G.H. Wang, T.A. Horbett and A.S. Hoffman, "Protein Adsorption to PEO Surfaces", J. Biomed. Mater. Res., 25, 1547-1562 (1991).

Park, T. G. and A.S. Hoffman, "Immobilization of *Arthrobacter simplex* in Thermally Reversible Hydrogel: Effect of Gel Hydrophobicity on Steroid Conversion", Biotech. Progr., 7, 383-390 (1991).

Hoffman, A.S., "Present and Emerging Applications of Polymeric Biomaterials", in "Polymer Science: Contemporary Themes", Vol. II, S. Sivaram, Ed. Tata McGraw-Hill Pub. Co. New Delhi (1991). [Also in Clinical Materials., 11 (1992).

### 1992

Nakamae, K., T. Miyata, and A.S. Hoffman, "Swelling Behavior of Hydrogels Containing Phosphate Groups", Makromol. Chem., 193, 983-990 (1992).

Dong, L.C., Q. Yan and A.S. Hoffman, "Controlled Release of Amylase from a Thermal and pH-Sensitive Macroporous Hydrogel", J. Contr. Rel., 19, 171-178 (1992).

Kiaei, D., A.S. Hoffman and S.R. Hanson, "Ex vivo and in vitro Platelet Adhesion on RFGD-Deposited Polymers", J. Biomed. Mater. Res., 26, 357-372 (1992).

Hoffman, A. S., "Molecular Bioengineering of Biomaterials in the 1990s and Beyond: A Growing Liaison of Polymers with Molecular Biology", Artificial Organs, 16, 43-39 (1992).

Gombotz, W. R., G.H. Wang, T.A. Horbett and A.S. Hoffman, "Protein Adsorption to and Elution From Polyether Surfaces", in "Biomedical Applications of Polyethylene Glycol Chemistry", J.M. Harris Ed., Plenum Press, N.Y, p. 247-261 (1992).

Antonsen, K.P. and A.S. Hoffman, "Water Structure of PEG Solutions by DSC Measurements", in *"Biomedical Applications of Polyethylene Glycol Chemistry"*, J.M. Harris, Ed., Plenum Press, N.Y., p. 15-28 (1992).

Pettit, D. K., T.A. Horbett and A.S. Hoffman, "Influence of the Substrate Binding Characteristics of Fibronectin on Corneal Epithelial Cell Outgrowth", *J. Biomed. Mater. Res.*, **26**, 1259-1275 (1992).

Bergstrom, K., K. Holmberg, A. Safranji, A.S. Hoffman, M.J. Edgall, A. Kozlowski, B.A. Hovanes and J.M. Harris, "Reduction of Fibrinogen Adsorption on PEG-Coated Polystyrene Surfaces", *J. Biomed. Mater. Res.*, **26**, 779-790 (1992).

Wu, X. S., A.S. Hoffman and P. Yager, "Synthesis and Characterization of Thermally-Reversible Macroporous Poly(N-Isopropylacrylamide) Hydrogels", *J. Polymer Sci. A. Pol. Chem.*, **30**, 2121-2129 (1992).

Wu, X.S., A. S. Hoffman and P. Yager, "Conjugation of Phosphatidylethanolamine to Poly(NIPAAm) for Potential Use in Liposomal Drug Delivery Systems", *Polymer*, **33**, 4659-4662 (1992).

Hoffman, A.S., "Immobilization of Biomolecules and Cells on and within Polymeric Biomaterials", *Clinical Materials*, **11**, 61-66 (1992).

Kiaei, D., A. S. Hoffman and T.A. Horbett, "Tight Binding of Albumin to Glow-Discharge Treated Polymers", *J. Biomats. Sci. Polymer Edn.*, **4**, 35-44 (1992).

Sheu, M.-S., A.S. Hoffman and J. Feijen, "A Glow-Discharge Treatment to Immobilize PEO/PPO/PEO Surfactants for Wettable and Non-Fouling Biomaterials", *J. Adhes. Sci. Tech.*, **6**, 995-1009 (1992).

Piskin, E., A.S. Hoffman, W.R. Gombotz, et. al., "Cell Culturing on Polymeric Beads", *Clinical Materials*, **11**, 171-178 (1992).

Hoffman, A.S., D. Kiaei, A. Safranji, J.P. Chen, A. Johnston, A. Horbett, F. Zavala, A.M. Deelder, J.B. Castalino and V. Markovic, "Adsorption, Retention, and Biologic Activity of Proteins Adsorbed on Gas-Discharge Treated Surfaces", *Clinical Materials*, **11**, 93-98 (1992).

Park, T.G. and A.S. Hoffman, "Synthesis and Characterization of pH- and/or Temperature-Sensitive Hydrogels", *J. Appl. Poly. Sci.*, **46**, 659-671 (1992).

Kiaei, D., A. Safranji, J.P. Chen, A.B. Johnston, F. Zavala, A. Deelder, J.B. Castalino, V. Markovic and A.S. Hoffman, "Immobilization of Proteins on Glow Discharge Treated Polymers", *Radiat. Phys. Chem.*, **39**, 463-467 (1992).

Park, T.G. and A.S. Hoffman, "Preparation of Large, Uniform Size Temperature-Sensitive Hydrogel Beads", *J. Poly. Sci. A., Poly. Chem.*, **30**, 505-507 (1992).

### **1993**

Morris, J.E., R. Fischer and A.S. Hoffman, "Affinity Precipitation of Proteins with Polyligands", *J. Anal Biochem.*, **41**, 991-997 (1993).

Terlingen, J.G.A., J. Feijen and A.S. Hoffman, "Immobilization of Surface Active Compounds on Polymer Supports Using Glow Discharge Processes: 1. Sodium Dodecyl Sulfate on Poly(propylene)", *J. Colloid Interface Sci.*, **155**, 55-65 (1993).

Wu, X.S., A.S. Hoffman and P. Yager, "Synthesis of and Insulin Release from Erodible PolyNIPAAm-Phospholipid Composites", *J. Intell. Mtls. Syst. and Struct.*, **4**, 202-209 (1993).

Antonsen, K.P., J.L. Bohnert, Y. Nabeshima, M.-S. Sheu, X.S. Wu and A.S. Hoffman, "Controlled Release of Proteins from 2-Hydroxyethyl Methacrylate Copolymer Gels", *J. Biomats., Artif. Cells, Immob'n Biotech.*, **21**, 1-22 (1993).

Park, T.G. and A.S. Hoffman, "Thermal Cycling Effects on the Bioreactor Performance of Immobilized B-Galactosidase in Temperature-Sensitive Hydrogel Beads", *Enzyme Microbial Tech.*, **15**, 476-482 (1993).

Wu, X.S., A.S. Hoffman and P. Yager, "Effect of Conjugation of Phospholipid to PolyNIPAAm on its Critical Solution Temperature", *Makromol Chem., Rapid Commun.*, **14** 309-314 (1993)

Terlingen, J. G. A., L. M. Brenneisen, T. J. Supèr, A. P. Pijpers, A. S. Hoffman and J. Feijen, "Introduction of Amine Groups on Poly(ethylene) by Plasma Immobilization of a Presorbed Layer of Decylamine Hydrochloride", *J. Biomtls Sci. Polymer Ed.*, **4**, 165-181 (1993).

Sheu, M.-S., A. S. Hoffman, J.G.A. Terlingen and J. Feijen, "A New Gas Discharge Process for Preparation of Non-Fouling Surfaces on Biomaterials", *Clinical Materials*, **13**, 41-45 (1993)

Chen, J. P., D. Kiaei, and A.S. Hoffman, "Activity of Horseradish Peroxidase Adsorbed on Radio Frequency Glow Discharge-Treated Polymers", *J. Biomtls Sci. Polymer Ed.*, **5**, 167-180 (1993).

Park, T. G. and A. S. Hoffman, "Synthesis and Characterization of a Soluble, Temperature-Sensitive Polymer-Conjugated Enzyme", *J. Biomtls Sci. Polymer Ed.*, **4**, 493-504 (1993)

Park, T.G. and A.S. Hoffman, "Sodium Chloride-Induced Phase Transition in Nonionic Poly(N-isopropylacrylamide) Gel", *Macromolecules*, **26**, 5045-5048 (1993)

Chen, G.H., and A.S. Hoffman, "Preparation and Properties of Thermoreversible, Phase-Separating Enzyme-Oligo(NIPAAm) Conjugates", *Bioconjugate Chem.*, **4**, 509-514 (1993)

Sheu, M.-S., A.S. Hoffman, B.D. Ratner, J. Feijen and J.M. Harris, "Immobilization of PEO Surfactants Using an Argon Glow Discharge Treatment.", *J. Adhesion Sci. and Tech.*, **7**, 1065-1076 (1993)

Terlingen, J.G.A., A.S. Hoffman and J. Feijen, "Effect of Glow Discharge Treatment of Polyacrylic acid Preadsorbed onto Polyethylene", *J. Appl. Poly. Sci.*, **50**, 1529-1539 (1993)

Stayton, P. S., Chilkoti, A., Long, C. J., Pettit, D. K., Tan, P. H. S., Chen, G., and Hoffman, A. "Engineered Proteins for Biomaterials" in *Mat. Res. Soc. Symp. Proc.* v. 292 (C. Viney, S. T. Case, and J. H. Waite, eds.) pp. 79-82 (1993).

#### **1994**

Park, T.G. and A.S. Hoffman, "Estimation of Temperature-Dependent Pore Sizes in Poly(NIPAAm) Hydrogel Beads", *Biotechnol. Progr.*, **10**, 82-86 (1994)

Chen, G. H. and A.S. Hoffman, "Synthesis of Carboxylated polyNIPAAm Oligomers and their Application to Form Thermo-Reversible Polymer-Enzyme Conjugates", *J. Biomtls. Sci. Polymer Ed.*, **5**, 371-382 (1994)

- Monji, N. C.A. Cole, and A. S. Hoffman, "Activated, N-Substituted Acrylamide Polymers for Antibody Coupling: Application to a Novel Membrane-Based Immunoassay", *J. Biomtls. Sci. Polymer Ed.*, 5, 407-420 (1994)
- Dong, L. C., A.S. Hoffman and Q. Yan, "Macromolecular Penetration through Hydrogels", *J. Biomtls. Sci. Polymer Ed.*, 5, 473-484 (1994)
- Terlingen, J.G.A., G.A.J. Takens, F.J. van der Gaag, A.S. Hoffman, and J. Feijen, "On the Effect of Treating Poly(acrylic acid) with Argon and Tetrafluoromethane Plasmas: Kinetics and Degradation Mechanism", *J. Appl. Poly. Sci.*, 52, 39-53 (1994)
- Pettit, D.K., A.S. Hoffman, and T.A. Horbett, "Correlation Between Corneal Epithelial Outgrowth and Monoclonal Antibody Binding to the Cell Binding Domain of Adsorbed Fibronectin", *J. Biomed. Mater. Res.*, 28, 685-691 (1994)
- Gombotz, W.R., S.C. Pankey, D. Phan, R. Drager, K. Donaldson, K.P. Antonsen, A.S. Hoffman, and H.V. Raff, "The Stabilization of a Human IgM Monoclonal Antibody with Poly(vinylpyrrolidone)", *J. Pharm. Res.*, 11, 624-632 (1994)
- Miyata, T., K. Nakamae, A.S. Hoffman, and Y. Kanzaki, "Stimuli-Sensitivities of Hydrogels Containing Phosphate Groups", *Macromol. Chem. Phys.*, 195, 1111-1120 (1994)
- Nakamae, K., T. Miyata, A. Jikihara, and A.S. Hoffman, "Formation of Poly(glucosyloxyethyl methacrylate)-Concanavalin A Complex and its Glucose Sensitivity", *J. Biomtls. Sci. Polymer Ed.*, 6, 79-90 (1994)
- Antonsen, K. P., W.R. Gombotz and A.S. Hoffman, "Attempts to Stabilize a Monoclonal Antibody with Water-Soluble Polymers of Varying Hydrophobicity", *J. Biomtls. Sci. Polymer Ed.*, 6, 55-65 (1994)
- Miura, M., C. A. Cole, N. Monji and A.S. Hoffman, "Temperature-Dependent Adsorption/Desorption Behavior of LCST Polymers on Various Substrates", *J. Biomtls. Sci. Polymer Ed.*, 5, 555-568 (1994)
- Puolakkainen, P.A., J.E. Ranchalis, W.R. Gombotz, R.P. Mumper, A.S. Hoffman, and D.R. Twardzik, "Novel delivery System for Inducing Quiescence in Intestinal Stem Cells in Rats by TGF-b1: A Mechanism of Mucosal Protection", *Gastroent.*, 107, 1319-1326 (1994)
- Chilkoti, A., G.H. Chen, P.S. Stayton and A.S. Hoffman, "Site-Specific Conjugation of a Temperature-Sensitive Polymer to a Genetically-Engineered Protein", *Bioconj. Chem.*, 5, 504-507 (1994)
- Bergstrom, K., E. Osterberg, K. Holmberg, A.S. Hoffman, T.P. Schuman, A. Kozlowski, and J.M. Harris, "Effects of Branching and Molecular Weight of Surface-Bound PEO on Protein Rejection", *J. Biomtls. Sci. Polymer Ed.*, 6, 123-132 (1994)
- Sheu, M.S., A.S. Hoffman, B.D. Ratner and J. Feijen, "Static SIMS Investigation of Glow Discharge-Treated Surfaces", *J. Appl. Pol. Sci. Appl. Pol. Symp.* 54, 29-40 (1994)
- Mumper, R.J., A.S. Hoffman, P.A. Puolakkainen, L.S. Bouchard, and W.R. Gombotz, "Calcium Alginate Beads for the Oral Delivery of TGF-b1: Stabilization of TGF-b1 by the Addition of Polyacrylic Acid within Acid-Treated Beads", *J. Contr. Rel.*, 30, 241-251 (1994)



**1995**

Chen, G.H., and A.S. Hoffman, "Graft copolymer compositions that exhibit temperature-induced transitions over a wide range of pH", *Nature*, 373, 49-52 (1995)

Chen, G.H. and A.S. Hoffman, "A new temperature- and pH-responsive copolymer for possible use in protein conjugation", *Macromol. Chem. Phys.*, 196, 1251-1259 (1995)

Kiaei, D., A.S. Hoffman, T.A. Horbett, and K.R. Lew, "Platelet and Monoclonal Antibody Binding to Fibrinogen Adsorbed on Glow Discharge-Deposited Polymers", *J. Biomed. Mater. Res.*, 29, 729-739(1995)

Chen, G.H. and A.S. Hoffman, "Temperature-induced phase transition behaviors of random vs. graft copolymers of NIPAAm and AAc", *Macromol. Rapid Comm.*, 16, 175-182 (1995)

Hoffman, A.S., "Intelligent Polymers in Medicine and Biotechnology", *Artif. Organs*, 19, 458-467 (1995)

Terlingen, J.G.A., Gerritsen, H.F.C., A. S. Hoffman and J. Feijen, "Introduction of Functional Groups on Polyethylene Surfaces by a CO<sub>2</sub> Plasma Treatment", *J. Appl. Polym. Sci.*, 57, 969-982 (1995)

Kiaei, D., A.S. Hoffman, and T.A. Horbett, "RFGD Fluorination of Polymers: Protein and Cell Interactions at RFGD-fluorinated Surfaces", *Rad'n Chem. and Phys* 46, 191-197 (1995)

Stayton, P.S., T. Shimoboji, C. Long, A. Chilkoti, G. Chen, J.M. Harris and A.S. Hoffman, "Control of protein-ligand recognition using a stimuli-responsive polymer", *Nature*, 378, 472-474 (1995)

Kiaei, D., A.S. Hoffman, and T.A. Horbett, "Platelet Adhesion to Fibrinogen Adsorbed on Glow Discharge-Deposited Polymers", in "Proteins at Interfaces II", eds. J. Brash and T.A. Horbett, *ACS Symp. Series 602*, (1995) p 450-462

Hoffman, A.S., "Intelligent Polymers in Medicine and Biotechnology", *Macromol. Symp.*, 98, 645-664 (1995)

**1996**

Ding, Z.L., G.H. Chen, and A.S. Hoffman, "Synthesis and Purification of Thermally-Sensitive Oligomer-Enzyme Conjugates of Poly(NIPAAm)-Trypsin", *Bioconj.Chem.*, 7, 121-125 (1996)

Terlingen, J.G.A., A. Bruil, A.S. Hoffman and J. Feijen, "Plasma modification of polymeric surfaces for biomedical applications," eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p38-42.

Hoffman, A.S., G.H. Chen, S.Y. Kaang, Z.L. Ding, K. Randeri and B. Kabra, "Novel bioadhesive, pH-and temperature-sensitive graft copolymers for prolonged mucosal drug delivery", eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p62-66.

Miyata, T., A. Jikihara, K. Nakamae, T. Uragami, A.S. Hoffman, K. Kinomura and M. Okumura, "Preparation of glucose-sensitive hydrogels by entrapment or copolymerization of concanavalin A in a glucosyloxyethyl methacrylate hydrogel", eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p237-238.

Nakamae, K., T. Nishino, Y. Saiki, Y. Yoshida, M. Okumura, K. Kinomura and A.S. Hoffman, "Stabilization of enzyme by polymer with pendant monosaccharide", eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p293-294.

Nakamae, K., T. Nizuka, T. Miyata, T. Uragami, A.S. Hoffman and Y. Kanzaki, "Stimuli-sensitive release of lysozyme from hydrogel containing phosphate groups", eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p313-314.

Terlingen, J.G.A., A. Bruil, A.S. Hoffman and J. Feijen, "Plasma modification of polymeric surfaces for biomedical applications," eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p38-42.

Nabeshima, Y., Z.L. Ding, G.H. Chen, A.S. Hoffman, H. Taira, K. Kataoka, and T. Tsuruta, "Slow Release of Heparin from a Hydrogel Made from Polyamine Chains Grafted to a Temperature-Sensitive Polymer Backbone", eds. N. Ogata, S.W. Kim, J. Feijen and T. Okano, *Advanced Biomaterials in Biomedical Engineering and Drug Delivery Systems*, Springer (1996) p315-316.

Hoffman, A.S., "Surface Modification of Polymers", *Macromol. Symp.*, **101**, 443-454 (1996) ; also in: *Chinese J. Polymer Sci.*, **13** (3), 195-203 (1995)

Hoffman, A.S., "Intelligent Polymers", *Polymer Materials Encyclopedia*, CRC Press, Boca Raton, FL. (1996)

Hoffman, A.S., "Surface-Modified Polymers", *Polymer Materials Encyclopedia*, CRC Press, Boca Raton, FL. (1996)

Blaylock, M.E. and A.S. Hoffman, "Affinity Binding on Argon Plasma-Immobilized Biotinylated Phospholipids", *Plasmas and Polymers*, **1**, 261-277 (1996)

Ratner, B.D., A.S. Hoffman, F.J. Schoen, and J.E. Lemons, Eds., "Biomaterials Science: An Introduction to Materials in Medicine", Academic Press, NY, NY (1996)

### **1997**

A.S. Hoffman, "Intelligent Polymers", in "Controlled Drug Delivery", ed. K. Park, ACS Publications, ACS, Washington, DC (1997)

H. Saito, X. Wu, J.M. Harris and A.S. Hoffman, "Graft Polymers of PEG and Chitosan", *Macromol. Rapid Commun.*, **18**, 547-550 (1997)

T. Inoue, G. Chen and A.S. Hoffman, "A Hydrophobically-Modified Bioadhesive Polyelectrolyte Hydrogel for Drug Delivery" *J. Contr. Rel.*, **49**, 167-176 (1997)

G. Chen, B. Kabra, K. Randeri, and A. S. Hoffman, "Synthesis and Thermally-Induced Gelation of Pluronic®-g-Polyacrylic Acid for Prolonged Drug Delivery to the Eye", in "Chemistry and Biological Applications of Polyethylene Glycol", eds. J.M. Harris and S. Zalipsky, *ACS Symposium Series*, 680, Chapter 27, ACS, Washington, DC, pp 441-457 (1997)

K. Nakamae, T. Nizuka, T. Miyata, M. Furukawa, T. Nishino, K. Kato, T. Inoue, A.S. Hoffman and Y. Kanzaki, "Lysozyme Loading and Release from Hydrogels Carrying Pendant Phosphate Groups", *J. Biomat. Sci., Polym. Ed.*, 9, 43-53 (1997)

P. Gatenholm, T. Ashida and A. S. Hoffman, "Hybrid Biomaterials Prepared by Ozone-Induced Polymerization. I. Ozonation of Microporous Polypropylene", *J. Poly. Sci., Chem. Ed.*, 1461-1467 (1997)

Hoffman, A. S Stayton, P. S., Shimoboji, T., Chen, G. H., Ding, Z. L., Chilkoti, A., Long, C., Miura-M., Chen, J. P., Park, T., Monji, N., Cole, C. A., Harris, J. M., Nakamae, K., "Conjugates of stimuli-responsive polymers and biomolecules: Random and site-specific conjugates of temperature-sensitive polymers and proteins" *Supermacromolecular Symposia* 118: 553-563 . (1997).

#### **1998**

T. Inoue, G. Chen, K. Nakamae and A.S. Hoffman, "Synthesis and Properties of a Novel Hydrogel Having Two Different Temperature-Responsive Oligomers Grafted to the Same Hydrogel Network", *Polymer Gels and Networks*, 6, (1998)

T. Inoue, G. Chen, K. Nakamae and A.S. Hoffman, "A Hydrophobically-Modified Bioadhesive Polymeric Carrier for Controlled Drug Delivery to Mucosal Surfaces", *J. Bioactive & Compatible Polymers*, 13, 50 (1998)

Z. Ding, G. Chen and A.S. Hoffman, "Properties of PolyNIPAAm-Trypsin Conjugates", *J. Biomed. Mater. Res.*, 39, 498-505 (1998)

A.S. Hoffman, "A Commentary on the Advantages and Limitations of Synthetic Polymer-Biomolecule Conjugates", in "Biorelated Functional Polymers: Controlled Release and Applications in Biomedical Engineering", ed. T. Okano, Academic Press, NY, NY, p 231-248 (1998)

T. Inoue, G. Chen, K. Nakamae and A.S. Hoffman, "Synthesis of a Novel A-B Block Copolymer of o-MMA and PAAc with Potential as a Bioadhesive Micelle for Mucosal Drug Delivery", *J. Contr. Rel.*, 51, 221-229 (1998)

P.S. Stayton and A.S. Hoffman, "Immobilization of Smart Polymer-Protein Conjugates" in "Immobilized Biomolecules in Analysis". Eds. T. Cass and F.S. Ligler, Oxford Univ. Press, Oxford, UK (1998) p 135-147

T. Inoue, G. Chen and A.S. Hoffman, "A Hydrophobically-Modified Bioadhesive Polyelectrolyte Hydrogel for Drug Delivery" *J. Contr. Rel.*, 49, 167-176 (1998)

#### **1999**

A.S. Hoffman, G. Chen, X. Wu, Z. Ding, J.E. Matsuura and W.R. Gombotz, "Stiumuli Responsive Polymers Grafted onto Polyacrylic Acid and Chitosan Backbones as Bioadhesive Carriers for Mucosal Drug Delivery", in "Frontiers in Biomedical Polymer Applications", Ed. R. M. Ottenbrite, Technomic Publ., Lancaster PA (1999) p 17-29

Z. Ding, C.J. Long, Y. Hayashi, E.V. Bulmus, A.S. Hoffman and P.S. Stayton, "Temperature Control of Biotin Binding and Release with a Streptavidin-PolyNIPAAm Site-Specific Conjugate", *J. Bioconj. Chem.*, **10**, 395-400 (1999)

C.A. Lackey, N. Murthy, O.W. Press, D.A. Tirrell, A.S. Hoffman and P.S. Stayton, "Hemolytic Activity of pH-responsive Polymer-Streptavidin Bioconjugates", *Bioconj. Chem.* **10**, 401-405 (1999)

T.R. Kyriakides, K.J. Leach, A.S. Hoffman, B.D. Ratner and P. Bornstein, "Mice that Lack the Angiogenesis Inhibitor, Thrombospondin 2, Mount an Altered Foreign Body Reaction Characterized by Increased Vascularity", *PNAS*, **96**, 4449-4454 (1999)

Murthy, N., Robichaud, J. R., Tirrell, D. T., Stayton, P. S., and Hoffman, A. S. (1999) "The design and synthesis of polymers for eukarotic membrane disruption" *J. Cont. Rel.*, **61**, 137-143.

R.B. Fong, Z. Ding, C.J. Long, A.S. Hoffman and P.S. Stayton, "Thermoprecipitation of Streptavidin via Oligonucleotide-Mediated Self-Assembly with Poly(NIPAAm)", *Bioconj. Chem.* **10**, 720-725 (1999)

V. Bulmus, Z. Ding, C.J. Long, P.S. Stayton and A.S. Hoffman, "Design, Synthesis and Site-Specific Conjugation of a pH- and Temperature-Sensitive Polymer to Streptavidin for pH-Controlled Binding and Triggered Release of Biotin", *Bioconj. Chem.*, **11**, 78-83 (1999)

J. Chen, Y.C. Nho, O.H. Kwon, A.S. Hoffman, "Grafting copolymerization of acrylamides onto preirradiated PP films", *Radn. Phys. Chem.*, **55**, 87-92 (1999) *also seen in:* J. Chen, Y.C. Nho, O.H. Kwon, A.S. Hoffman, "Grafting copolymerization of PEGMA onto preirradiated PP films", *J. Radioanalytical Nucl. Chem.*, **240**, 943-948 (1999)

A.S. Hoffman, "Non-fouling Surface Technologies", *J. Biomater. Sci., Polymer Ed.*, **10**, 1011-1014 (1999)

P.S. Stayton, K.E. Nelson, T.C. McDevitt, V. Bulmus, T. Shimoboji, Z. Ding and A.S. Hoffman, *Biomol. Eng.*, **16**, 93-99 (1999)

## **2000**

P.S. Stayton, A.S. Hoffman, N. Murthy, C. Lackey, C. Cheung, P. Tan, L.A. Klumb, A. Chilkoti, F.S. Wilbur, O.W. Press, "Molecular engineering of proteins and polymers for targeting and intracellular delivery of therapeutics", *J. Contr. Rel.*, **65**, 203-220 (2000)

A.S. Hoffman, et al., "Really Smart Bioconjugates of Smart Polymers and Receptor Proteins", *J. Biomed. Mater. Res.*, **52**, 577-586 (2000) (Article in honor of receiving FOUNDERS' AWARD OF SOCIETY FOR BIOMATERIALS, 2000)

H.M. Zareie, V. Bulmus, P.A. Gunning, A.S. Hoffman, E. Piskin and V.J. Morris, "Investigation of a pH- and temperature-sensitive polymer by AFM", *Polymer*, **41**, 6723-6727 (2000)

N.D. Winblade, I.D. Nikolic, A.S. Hoffman and J.A. Hubbell, "Blocking Adhesion to Cell and Tissue Surfaces by the Chemisorption of a Poly(L-lysine-graft-PEG:Phenylboronic acid) Copolymer", *Biomacromolecules*, **1**, 523-533 (2000)

B.S. Lele and A.S. Hoffman, "Insoluble ionic complexes of PAA with a cationic drug for use as a mucoadhesive, ophthalmic drug delivery system", *J. Biomat. Sci., Polym. Ed.*, **12**, 1319-1321 (2000)

B.S. Lele and A.S. Hoffman, "Mucoadhesive drug carriers based on complexes of poly(acrylic acid) and PEGylated drugs having hydrolysable PEG- anhydride-drug linkages, *J. Contr. Rel.*, 69, 237-248 (2000)

### 2001

G.Chen and A.S. Hoffman, "Temperature and pH-sensitive Graft Copolymers", Chapter 1 in "Smart Polymers for Bioseparations and Bioprocessing", eds, B. Mattiasson and I. Galaev, Harwood Academic Publ., Amsterdam, The Netherlands (2001) p 1-27

N. Murthy, I. Chang, P.S. Stayton and A.S. Hoffman, "pH-sensitive Hemolysis by Random Copolymers of Alkyl Acrylates and Acrylic Acid", *Macromol. Symposia*, 172, 49-55 (2001)

Z. Ding, Fong, R. B., Long, C. J., Hoffman, A. S. and Stayton, P. S. (2001) "Size-dependent control of the binding of biotinylated proteins to streptavidin using a polymer shield" *Nature*, 411, 59-62.

P.D. Mourad, N. Murthy, T.M. Porter, S.L. Poliachik, L.A. Crum, A.S. Hoffman and P.S. Stayton, "Focused Ultrasound and Poly(2-Ethylacrylic Acid) Act Synergistically to Disrupt Lipid Bilayers in Vitro", *Macromolecules* 34, 2400-2401 (2001)

C.D. Brown and A.S. Hoffman, "Modification of Natural Polymers: Chitosan," Chapter 47 in "Methods of Tissue Engineering", Atala A. and Lanza R., Eds., Academic Press, San Diego, (2001) p 565-574

C.D. Brown, L. Kreilgaard, M. Nakakura, N. Carem-Lelham, D.K. Pettit, W.R. Gombotz and A.S. Hoffman, "Release of PEGylated GM-CSF from Chitosan/glycerol Films", *J. Contr. Rel.* 72, 35-46 (2001)

A. Goessl, D.F. Bowen-Pope, and A.S. Hoffman, "Control of shape and size of vascular smooth muscle cells in vitro by plasma lithography", *J. Biomed. Mater. Res.*, 57, 15-24 (2001)

A. Goessl, M.D. Garrison, J.B. LHoest, and A.S. Hoffman, "Plasma Lithography—thin film patterning of polymeric biomaterials by RF plasma polymerization I: Surface preparation and analysis", *J. Biomater. Sci., Pol. Ed.*, 12, 721-738 (2001)

A. Goessl, S.L. Gollodge, and A.S. Hoffman, "Plasma Lithography—thin film patterning of polymeric biomaterials by RF plasma polymerization II: Study of differential binding using adsorption probes", *J. Biomater. Sci., Pol. Ed.*, 12, 739-753 (2001)

T.K. De and A.S. Hoffman, "A Reverse Microemulsion Polymerization Method for Preparation of Bioadhesive Polyacrylic Acid Nanoparticles for Mucosal Drug Delivery: Loading and Release of Timolol Maleate", *Art. Cells, Blood Subs., and Immob. Biotech.*, 29, 31-46 (2001)

T.K. De and A.S. Hoffman, "An Ophthalmic Formulation of a Beta-adrenoceptor Antagonist, Levobetaxolol, using PAA Nanoparticles as Carriers: Loading and Release Studies", *J. Bioact. Compat. Polys*, 16, 20-31 (2001)

T. Shimoboji, Z. Ding, P.S. Stayton and A.S. Hoffman, "Mechanistic Investigation of Smart Polymer-Protein Conjugates", *Bioconj. Chem.*, 12, 314-319 (2001)

A.S. Hoffman, "Hydrogels for Biomedical Applications", *Ann. NY Acad. Sci.*, 944, (Oct., 2001)

A.S. Hoffman, P.S. Stayton, O.W. Press, N. Murthy, C.A. Lackey, C. Cheung, F.E. Black, J. Campbell, N. Fausto, T.R. Kyriakides and P. Bornstein, "Bioinspired Polymers that Control Intracellular Drug Delivery", *Biotech., Bioprocess Eng. (Korea)*, **6**, 205-212 (2001)

S. Anastase-Ravion, Z. Ding, A. Pelle, A.S. Hoffman and D. Letourneur, "New antibody purification procedure using a thermally-responsive polyNIPAAm-dextran derivative conjugate", *J. Chromat. B*, **761**, 247-254 (2001)

C.Y. Cheung, N. Murthy, P.S. Stayton and A.S. Hoffman, "A pH-sensitive Polymer that Enhances Cationic Lipid-Mediated Gene Transfer", *Bioconj. Chem*, **12**, 906-910 (2001)

N.D. Winblade, H. Schmokel, M. Baumann, A. S. Hoffman and J. A. Hubbell, "Sterically Blocking Adhesion of Cells to Biological Surfaces with a Surface-Active Copolymer Containing PEG and Phenylboronic Acid", *J. Biomed. Mater. Res.*, **59**, 618-631 (2001)

## **2002**

P.S. Stayton, Hoffman, A. S., Press, O. W., Murthy, N., Lackey, C., Cheung, C., Shimoboji, T., Ding, Z., Black, F., Campbell, J. S., Fausto, N., Kyriakides, T. R., and Bornstein, P. "Bioinspired engineering of intelligent drug delivery systems and protein-polymer conjugates" in *Biomimetic Materials and Design: Biointerfacial Strategies, Tissue Engineering, and Targeted Drug Delivery*. (A. K. Dillow and A. M. Lowman, eds.) Marcel Dekker Inc. pp. 471-506 (2002).

T.R. Kyriakides, C.Y. Cheung, N. Murthy, P. Bornstein, P.S. Stayton, and A.S. Hoffman, "pH-Sensitive Polymers that Enhance Intracellular Drug Delivery in vivo", *J. Contr. Rel.*, **78**, 295-303 (2002)

A.S. Hoffman, "Hydrogels for Biomedical Applications", *Adv. Drug Del. Revs.*, **43**, 3-12 (2002)

J.R. Bain and A.S. Hoffman, "Glycophase glass revisited: protein adsorption and cell growth on glass surfaces bearing immobilized glycerol monosaccharides", *Biomaterials*, **23**, 3347-3357 (2002)

R.B. Fong, Z. Ding, A.S. Hoffman and P.S. Stayton, "Affinity separation using an Fv antibody fragment-Smart polymer conjugate", *Biotechnol. Bioeng.*, **79**, 271-276 (2002)

C.A. Lackey, O.W. Press, A.S. Hoffman, and P.S. Stayton, "A Biomimetic pH-Responsive Polymer Directs Endosomal Release and Intracellular Delivery of an Endocytosed Antibody Complex", *Bioconj. Chem.* **13**, 996-1001 (2002) (This paper received an Award as one of the Outstanding PhD Student Papers at the 2000 Controlled Release Society meeting)

T. Shimoboji, Z.L. Ding, P.S. Stayton and A.S. Hoffman, "Photoswitching of Ligand Association with a Photoresponsive Polymer-Protein Conjugate" *Bioconj. Chem.*, **13**, 915-919 (2002)

T. Shimoboji, E. Larenas, T. Fowler, S. Kulkarni, A.S. Hoffman and P.S. Stayton, "Photoresponsive polymer-enzyme switches", *PNAS*, **99**, 16592-6 (2002)

## **2003**

T. Shimoboji, E. Larenas, T. Fowler, A.S. Hoffman, and P.S. Stayton, "Temperature-Induced Switching of Enzyme Activity with Smart Polymer-Enzyme Conjugates", *Bioconj. Chem.* **14**, 517-525 (2003)

N. Murthy, Campbell, J., Fausto, N., Hoffman, A. S., and Stayton, P. S., "Bioinspired polymeric carriers that enhance intracellular delivery of biomolecular therapeutics" *Bioconj. Chem.* 14, 412-419 (2003)

N. Murthy, Campbell, J., Fausto, N., Hoffman, A. S., and Stayton, P. S., "Design and synthesis of pH-Responsive Polymeric Carriers That Target Uptake and Enhance The Intracellular Delivery of Oligonucleotides to Hepatocytes " *J. Contr. Rel.*, 89(3); 365-374 (2003)

V. Bulmus, M. Woodward, L. Lin, P.S. Stayton and A.S. Hoffman, "A new pH-responsive and glutathione-reactive, membrane-disruptive polymeric carrier for intracellular delivery of biomolecular drugs", *J. Contr. Rel.*, 93 105– 120 (2003)

N. Malmstadt, P. Yager, A.S. Hoffman, and P.S. Stayton, "A Smart Microfluidic Affinity Chromatography Matrix Composed of Poly(N-isopropylacrylamide)-Coated Beads", *Anal Chem*, 75, 2943-2949 (2003) (Accelerated Article)

R.A. Jones, C.C. Cheung, F.E. Black, J.K. Zia, P.S. Stayton, A.S. Hoffman, and M.R. Wilson, "Poly(2-alkylacrylic acid) polymers deliver molecules to the cytosol by pH-sensitive disruption of endosomal vesicles", *Biochem. J.*, 372, 66-75 (2003)

J.L. Cuy, B.L. Beckstead, C.D. Brown, A.S. Hoffman and C.M. Giachelli, "Adhesive Protein Interactions with Chitosan: Consequences for Valve Endothelial Cell Growth on Tissue-engineering Materials", *J. Biomed. Mater. Res.*, 67A, 538-547 (2003)

N. Malmstadt, D. Hyre, Z. Ding, A.S. Hoffman and P.S. Stayton, "Affinity Thermoprecipitation and Recovery of Biotinylated Biomolecules via a Mutant Streptavidin-Smart Polymer Conjugate", *Bioconj. Chem.*, 14, 575-580 (2003)

## 2004

S. Kulkarni, C. Schilli, A. Müller, A.S. Hoffman and P.S. Stayton, "Meso-scale Smart Polymer-Protein Particles that Form Reversibly and with Controlled Sizes" *Bioconj Chem.* 15 (4):747-53 (2004)

N. Malmstadt, A.S. Hoffman and P.S. Stayton, "Smart Mobile Affinity Matrix for Microfluidic Immunoassays", *Lab Chip*, 4, 412-415 (2004)

S.K. Hahn, S. Jelacic, R.V. Maier, P.S. Stayton and A.S. Hoffman, "Anti-inflammatory Drug Delivery from Hyaluronic Acid Hydrogels", *J. Biomater. Sci, Pol. Ed.*, 15, 1111-1120 (2004)

A.S. Hoffman, P.S. Stayton, O.W. Press, N. Murthy, C.A. Lackey, C. Cheung, F. Black, J. Campbell, N. Fausto, T.R. Kyriakides, and P. Bornstein, "Bioinspired Synthetic Polymers that Direct Intracellular Trafficking of Drugs", *Indian J. Nanotechnology*, NISCAIR, New Delhi, India (2004)

J. Cuschieri, Bulmus V, Gourlay D, Garcia I, Hoffman A, Stayton P, Maier RV. "Modulation of macrophage responsiveness to lipopolysaccharide by IRAK-1 manipulation." *Shock*. 21(2):182-8 (2004).

P.S. Stayton, Ding Z, Hoffman A.S. "Smart polymer-streptavidin conjugates. *Methods Mol Biol.* 283: 37-44 (2004).

R. Ohri, Hahn SK, Hoffman AS, Stayton PS, Giachelli CM. "Hyaluronic acid grafting mitigates calcification of glutaraldehyde-fixed bovine pericardium." *J Biomed Mater Res.* 70A(2):328-34 (2004).

T. Miyata, A. Jikihara, K. Nakamae and A.S. Hoffman, "Preparation of reversibly glucose-responsive hydrogels by covalent immobilization of lectin in polymer networks having pendant glucose", *J. Biomater. Sci, Pol. Ed.*, **15**, 1081-1084 (2004)

J. Chen, Y.C. Nho, and A.S. Hoffman, "Grafting Copolymerization of 2-Mechacryloyloxyethyl phosphoryl-choline (MPC) onto Pre-irradiated Cellulose Films", *J. Biomater. Sci, Pol. Ed.*, **15**, 841-850 (2004)

Ratner, B.D., A.S. Hoffman, F.J. Schoen, and J.E. Lemons, Eds., "Biomaterials Science: An Introduction to Materials in Medicine", 2<sup>nd</sup> Edition, Elsevier/Academic Press, NY, NY (2004).

Porter, T. M., Crum, L. A., Stayton, P. S., Hoffman, A. S., "Effect of polymer surface activity on cavitation nuclei stability against dissolution" *J Acoust Soc Am.* **116**, 721-728 (2004)

### **2005**

T. Kiang, C. Bright, C.Y. Cheung, P.S. Stayton, A.S. Hoffman and K.W. Leong, "Formulation of Chitosan/DNA Nanoparticles with Poly(propylacrylic acid) Enhances Gene Expression", *J. Biomater. Sci, Pol. Ed.*, **15**, 1405-1422 (2005)

K. Nakamae, T. Nishino, K. Kato, T. Miyata and A.S. Hoffman, "Synthesis and Characterization of Stimuli-sensitive Hydrogels having Different Lengths of Ethylene Glycol-Phosphate Pendant Groups: Loading and Release of Lysozyme", *J. Biomater. Sci, Pol. Ed.*, **15**, 1435-1446 (2005)

Porter TM, Murthy N, Mourad PD, Stayton PS, Hoffman AS., "Control of cavitation-induced hemolysis with a surface-active polymer" *Acoustics Research Letters Online* **6**, 201-206 (2005)

C.D. Brown, P.S. Stayton and A.S. Hoffman, "Semi-IPN of PEG and Polylactide for the Controlled Delivery of Protein Drugs", *J. Biomater. Sci, Pol. Ed.*, **16**, 189-202 (2005)

P. Sadurni, A. Alagon, R. Aliev, G. Burillo and A.S. Hoffman, "Immobilization of Streptavidin-HRP onto a Biotinylated PAAc Backbone that had been Radiation Grafted to a PTFE Film", *J. Biomater. Sci, Pol. Ed.*, **16**, 181-188 (2005)

J.J. Hwang, S. Jelacic, N.T. Samuel, R.V. Maier, C.T. Campbell, D.G. Castner, A.S. Hoffman and P.S. Stayton, "Monocyte Activation on Polyelectrolyte Multilayers", *J. Biomater. Sci, Pol. Ed.*, **16**, 237-252 (2005)

C.Y. Cheung, P.S. Stayton and A.S. Hoffman, "Poly(propylacrylic acid) reduces the Inactivation of Polyplexes by Serum", *J. Biomater. Sci, Pol. Ed.*, **16**, 163-180 (2005)

P.S. Stayton, A.S. Hoffman, M. El-Sayed, S. Kulkarni, T. Shimoboji, N. Murthy, V. Bulmus and C. Lackey, "Intelligent Biohybrid Materials for Therapeutic and Imaging Agent Delivery", *Proc. IEEE*, **93**, 726-736 (2005)

D. Pack, A.S. Hoffman, S. Pun and P.S. Stayton, "Design and Development of Polymers for Gene Delivery", *Nature Reviews, Drug Discovery*, **4**, 581-593 (2005)

### **2006**

G. Tae, M. Scatena, P.S. Stayton, and A.S. Hoffman, "PEG-Crosslinked Heparin is an Affinity Hydrogel for Sustained Release of VEGF", *J. Biomater. Sci, Pol. Ed.*, **17**, 187-197 (2006)



A.S. Hoffman, "Selecting the Right Polymer for Biomaterial Applications", Chapter 1 in "Drug Delivery", ed. I. F. Uchegbu, Taylor & Francis, London (2006) p 7-23.

M. Ebara, J.M. Hoffman, A.S. Hoffman, and P.S. Stayton, "Switchable surface traps for injectable bead-based chromatography in PDMS microfluidic channels", *Lab Chip*, 6(7), 843-8 (2006).

X. Yin, P.S. Stayton and A.S. Hoffman, "Temperature- and pH-Responsiveness of Poly(*N*-Isopropylacrylamide-co-Propylacrylic acid) Copolymers Prepared by RAFT Polymerization" *Biomacromol.*, 7, 1381-5 (2006).

S.M. Henry, M.E.H. El-Sayed, C.M. Pirie, P.S. Stayton, and A.S. Hoffman, "pH-Responsive Poly(styrene-alt-maleic anhydride) Copolymers for Intracellular Drug Delivery", *Biomacromol.*, 7, 2407-14 (2006).

S. Kulkarni, C. Schilli, B. Grin, A.H.E. Müller, A.S. Hoffman, and P.S. Stayton, "Controlling the Aggregation of Conjugates of Streptavidin with Smart Block Copolymers Prepared via the RAFT Copolymerization Technique", *Biomacromol.*, 7, 2736-41 (2006)

## 2007

Kulkarni, S., Malmstadt, N., Hoffman, A. S., and Stayton, P. S. "Micro- and nanoscale smart polymer technologies in biomedicine", in *BioMEMS and Biomedical Nanotechnology Vol1: Biomedical & Biological Nanotechnology*. Ferrari, Mauro (Ed.) p 289-304 2007; Springer. ISBN: 978-0-387-25561-3

Peppas, N.A., Hoffman, A.S., Kanamori, T. and Tojo, K., Eds, "Advances in Medical Engineering, Drug Delivery Systems and Therapeutic Systems", AIChE Annual Meeting, Nov. 2006, AIChE Press ISBN 0-8159-1013-8, AIChE Pub. No. P-236 (2007)

Ebara, M., Hoffman, J., Stayton, P.S., and Hoffman, A.S., "Surface Modification of Microfluidic Channels by UV-mediated Graft Polymerization of Non-fouling and 'Smart' Polymers" *Radn Phys & Chem* 76, 1409-1413 (2007)

Narain R., Gonzales M., Hoffman, A.S., Stayton P.S., and Krisnan K.M., "Synthesis of Monodisperse Biotinylated p(NIPAAm)-Coated Iron Oxide Magnetic Nanoparticles and their Bioconjugation to Streptavidin", *Langmuir*, 23, 6299-6304 (2007)

Tae G., Kim, Y.J., Choi, W.I., Kim, M., Stayton, P.S., and Hoffman, A.S., "Formation of a novel heparin-based hydrogel in the presence of heparin-binding biomolecules", *Biomacromol.*, 8 1979-1986 (2007)

Lai, J., Hoffman, A.S., and Stayton, P.S., "Dual Magnetic-Temperature Responsive Nanoparticles for Microfluidic Separations and Assays", *Langmuir*, 23, 7385-7391 (2007)

Hoffman, A.S. and Stayton, P.S., "Conjugates of Stimuli-Responsive Polymers and Proteins", *Prog In Polymer Sci*, 32, 922-932 (2007)

Hoffman, AS Stayton, PS, El-Sayed, M, Murthy, N, Bulmus, V, Lackey, C, and Cheung, C, "Design of "Smart" Nano-scale Delivery Systems for Biomolecular Therapeutics", *J Biomed Nanotech*, 3 (3) 213-217 (2007)

Hayashi, Y, Harris, JM and Hoffman AS, Low pH complexation of PEGylated proteins and 450kD poly(acrylic acid) for mucoadhesive delivery of PEGylated proteins, *J Reactive & Functional Polymers*, (2007)

**2008**

Hoffman, AS (2008) The origins and evolution of “controlled” drug delivery systems, *J Contr Rel*, 132, 153–163.

Rodriguez VB, Henry SM, Hoffman AS, Stayton PS, Li X, Pun SH. 2008. Encapsulation and stabilization of indocyanine green within poly(styrene-alt-maleic anhydride) block-poly(styrene) micelles for near-infrared imaging. *J Biomed Opt* 13(1):014025.

McGonigle JS, Tae G, Stayton PS, Hoffman AS, Scatena M. 2008. Heparin-regulated delivery of osteoprotegerin promotes vascularization of implanted hydrogels. *J Biomater Sci Polym Ed* 19(8):1021-34.

Stayton, PS & AS Hoffman, Smart pH-Responsive Carriers for Intracellular Delivery of Biomolecular Drugs, in “Multifunctional Pharmaceutical Nanocarriers”, V. Torchilin, Ed., Springer (2008)

Johns RE, El-Sayed ME, Bulmus V, Cuschieri J, Maier R, Hoffman AS, Stayton PS. “Mechanistic analysis of macrophage response to IRAK-1 gene knockdown by a smart polymer-antisense oligonucleotide therapeutic” *J Biomater Sci Polym Ed* 19(10):1333-46 (2008)

**2009**

Convertine, AJ, Benoit, DSW, Duvall, CL, Hoffman, AS, and Stayton, PS, “Development of a novel endosomal lytic diblock copolymer for siRNA delivery, *J Contr Rel*. 133 (2009) 221-229

Henry SM, Convertine AJ, Benoit DS, Hoffman AS, Stayton PS “End-functionalized polymers and junction-functionalized diblock copolymers via RAFT chain extension with maleimido monomers” *Bioconj Chem* 20(6):1122-8 (2009)

Flanary S, Hoffman AS, Stayton PS “Antigen delivery with PPAA [poly(propylacrylic acid)] conjugation enhances MHC-1 presentation and T-cell Activation” *Bioconj Chem* 20(2):241-8 (2009)

Lai JJ, Nelson KE, Nash MA, Hoffman AS, Yager P, Stayton PS. “Dynamic bioprocessing and microfluidic transport control with smart magnetic nanoparticles in laminar-flow devices” *Lab Chip* 9(14):1997-2002 (2009)

**2010**

Hoffman, AS and Stayton, PS (2010) Conjugates of stimuli-responsive polymers and proteins, *Prog Polym Sci*, 32, 922-932.

Nash MA, Lai JJ, Hoffman AS, Yager P, Stayton PS. "Smart Diblock Copolymers as Templates for Magnetic-Core Gold-Shell Nanoparticle Synthesis" *Nano Letters*, 10, 85-89 (2010)

Eun Ju Oh, Kitae Park, Ki Su Kim, Jiseok Kim, Jeong-A Yang, Ji-Hyun Kong, Min Young Lee, Allan S. Hoffman, Sei Kwang Hahn, “Target specific and long-acting delivery of protein, peptide, and nucleotide therapeutics using hyaluronic acid derivatives” *J Contr Rel*, 141, 2–12 (2010)

Duvall CL, Convertine AJ, Benoit DS, Hoffman AS, Stayton PS. “Intracellular Delivery of a Proapoptotic Peptide via Conjugation to a RAFT-Synthesized Endosomal lytic Polymer”, *Molecular Pharm.*, 7, 468-472 (2010)

Jessica C. Garbern, Allan S. Hoffman, and Patrick S. Stayton, "Injectable pH- and Temperature-Responsive Poly(N-isopropylacrylamide-co-propylacrylic acid) Copolymers for Delivery of Angiogenic Growth Factors", *Biomacromolecules* 2010,, xxx, 000

Crownover EF, Convertine AJ, Hoffman AS, Stayton PS. "Synthesis of pH-Responsive Poly(PropylAcrylic Acid) Graft Copolymers via Click Chemistry" *Biomacromol* (Submitted, 2009)

Hoffman J, Stayton PS, Hoffman AS, Lai J-i, Ebara M, Folch A. Protein-Polymer Conjugate Capture, Enrichment and Release in "Smart" Microchannels, *Lab Chip* (2010)

AL Golden, CF Battrell, S Pennell, AS Hoffman, JJ Lai, and PS Stayton, Simple Fluidic System for Purifying and Concentrating Diagnostic Biomarkers Using Stimuli-Responsive Antibody Conjugates and Membranes, *Bioconj Chem*, 21, 1820-1826 (2010)

Kai Wang, Sangeetha Purushotham, Ji-Young Lee, Moon-Hee Na, Hyekyung Park, Sun-Jeong Oh, Rang-Woon Park, Jae Yong Park, Eungbae Lee, Byung Chae Cho, Mi-Na Song, Moon-Chang Baek, Wonjung Kwak, Jeongsoo Yoo, Allan S. Hoffman, Yu-Kyoung Oh, In-San Kim, Byung-Heon Lee (2010) In vivo imaging of tumor apoptosis using histone H1-targeting peptide, *J Contr Rel*, 148, 283-291

Russell N. Johnson, Rob S. Burke, Anthony J. Convertine, Allan S. Hoffman, Patrick S. Stayton, and Suzie H. Pun, Synthesis of Statistical Copolymers Containing Multiple Functional Peptides for Nucleic Acid Delivery, *Biomacromolecules*, 11, 3007–3013 (2010)

## 2011

Crownover, E, Duvall, CL, Convertine, A, Hoffman, AS, Stayton, PS (2011) RAFT-synthesized graft copolymers that enhance pH-dependent membrane destabilization and protein circulation times, *J Contr Rel* (<http://www.sciencedirect.com/science/article/pii/S0168365911004019>)

Nash, M, Yager, P, Hoffman, AS, Stayton, PS (2011) A Mixed Stimuli-Responsive Gold and Magnetic Nanoparticle System for Rapid Purification, Enrichment, and Detection of Diagnostic Targets, *Bioconj Chem*, in press

Kai Wang, Moon-Hee Na, Allan S. Hoffman, Gayong Shim, Su-Eun Han, Yu-Kyoung Oh, Ick Chan Kwon, In-San Kim, Byung-Heon Lee (2011) In situ dose amplification by apoptosis-targeted drug delivery, *J Contr Rel*, 154, 214-217

Xiaofeng He, Moon-Hee Na, Jin-Sook Kim, Ga-Young Lee, Jae Yong Park, Allan S. Hoffman, Ju-Ock Nam, Su-Eun Han, Ga Yong Sim, Yu-Kyoung Oh, In-San Kim, and Byung-Heon Lee (2011) A novel peptide probe for imaging and targeted delivery of liposomal doxorubicin to lung tumor. *Mol Pharmaceut*, 8, 430-438.

## 2012

Hoffman A.S. and Wright, J.C. (2012) "Historical Overview of Long Acting Injections and Implants" in J.Wright and D. Burgess, editors, Long Acting Injections and Implants, Springer, New York. p11-24.

Kim JH, Bae SM, Na MH, Shin H, Yang YJ, Min KH, Choi KY, Kim K, Park RW, Kwon IC, Lee BH, Hoffman AS, Kim IS (2012) Facilitated intracellular delivery of peptide-guided nanoparticles in tumor tissues, *J Contr Rel*, 157, 493-499

Tang ACL, Hwang GL, Tsai SJ, Chang MY, Tang ZCW, Tsai MD, Luo CY, Hoffman AS, Hsieh PCH (2012) Biosafety of Non-Surface Modified Carbon Nanocapsules as a Potential Alternative to Carbon Nanotubes for Drug Delivery Purposes, *PLoS One*, March 22, 2012

H Tai, CL Duvall, AS Hoffman, PS Stayton, W Wang, pH-Responsive Hyperbranched Copolymers from One-Pot RAFT Copolymerization, *Macromol. Mater. Eng.*, (2012) DOI: 10.1002/mame.201200227

MA Nash, JN Waitumbi, AS Hoffman, P Yager, and PS Stayton. Multiplexed Enrichment and Detection of Malarial Biomarkers Using a Stimuli-Responsive Iron Oxide and Gold Nanoparticle Reagent System, (2012) *ACS Nano* 6, 6776–6785.

Park, K.M., Yang, J.-A., Jung, H., Yeom, J., Park, J.S., Park, K.-H., Hoffman, A.S., Hahn, S.K., Kim, K., In situ supramolecular assembly and modular modification of hyaluronic acid hydrogels for 3D cellular engineering, *ACS Nano*, 6 (2012), 2960 – 2968.

### 2013

M Ebara, JM Hoffman, AS Hoffman, PS Stayton, and JJ Lai, A Photo-induced Nanoparticle Separation in Microchannels via pH-sensitive Surface Traps, *Langmuir* (2013) 29, 5388–5393

Hoffman AS, Biomaterials in the Nano-era, *Chin Sci Bull*, (2013) 58: doi: 10.1007/s11434-013-6090-x

Liao WY, Li HJ, Chang MY, Tang AC, Hoffman AS, Hsieh PC. Comprehensive characterizations of nanoparticle biodistribution following systemic injection in mice, *Nanoscale*, (2013) 5, 11079-11086.

### 2014

JA MacKay, A Almutairi, W Hennink, AS Hoffman, “NanoDDS, 2013: The 11th International Nano Drug Delivery Symposium”, *J Contr Rel*, 191, 1-3. (2014) doi:10.1016

T Omura, M Ebara, JJ Lai, X Yin, AS Hoffman, and PS Stayton, Design of Smart Nanogels that Respond to Physiologically Relevant pH Values and Temperatures, *J Nanosci & Nanotech*, 14 (2014) 2557-2562.

R Namgung, YM Lee, J Kim, Y Jang, BH Lee, IS Kim, P Sokkar, YM Rhee, AS Hoffman and WJ Kim, Poly-cyclodextrin and poly-paclitaxel nano-assembly for anticancer therapy, *Nature Comm* 5:3702 doi: 10.1038/ncomms4702 (2014).

AS Hoffman, “Poly(NIPAAm) Revisited”, This invited article by AS Hoffman is a commentary on three highly cited papers written by AS Hoffman and coauthors. "Highly cited research articles in *Journal of Controlled Release*: Commentaries and perspectives by authors”, *J Contr Rel*, 190, 1-674 (2014) (30th Anniv Special Issue, Ed S Mitragotri)

### 2015

Hoffman J, Hoffman AS, Lai JJ, Stayton PS. Stimuli-responsive reagent system for enabling microfluidic immunoassays with biomarker purification and enrichment. *Bioconj Chem* (2015) Jan 21;26(1):29-38. doi: 10.1021/bc500522k.

**2016**

AS Hoffman, "The Early Days of PEG and PEGylation (1970s-1990s)" *Acta Biomaterialia*; accepted and in press; to be published in 2016.

AS Hoffman and A. Hillery, Historical Introduction to the Field of Drug Delivery and Targeting; invited as the introductory chapter in the book: "Drug Delivery and Targeting Fundamentals, Applications and Future Directions", 2<sup>nd</sup> Edition, Taylor and Francis, London (to be published in 2016).

**Patents**

A.S. Hoffman and G. Schmer, "Method for Preparation of Biocompatible and Biofunctional Materials and Products Thereof," U.S. Patent 3,826,678 (7/30/74)

B.D. Ratner and A.S. Hoffman, "Process for Radiation Grafting Hydrogels onto Organic Polymer Substrates," U.S. Patent 3,939,049 (2/17/76)

A.S. Hoffman, "Method and Composition Containing Methyl Cyanoacrylate for Female Sterilization," U.S. Patent 4,359,454 (11/16/82)

R.C. Nowinski and A.S. Hoffman, "Polymerizable Compounds and Methods for Preparing Synthetic Polymers that Contain Integral Polypeptides," U.S. Patent 4,511,478 (4/16/85)

R.C. Nowinski and A.S. Hoffman, "Synthesis of Polymers Containing Integral Antibodies," U.S. Patent 4,609,707 (9/2/86)

A.S. Hoffman, A.G. Garfinkle, B.D. Ratner, and S.R. Hanson, "Plasma Gas Discharge Treatment for Improving the Biocompatibility of Biomaterials," U.S. Patent 4,656,083 (4/7/87)

R.C. Nowinski and A.S. Hoffman, "Polymerization-Induced Separation Immunoassays," U.S. Patent 4,711,840 (12/8/87)

E. Kinney-Thomas, R.C. Nowinski, D. Schwartz, J.H. Priest and A.S. Hoffman, "Polymerization Induced Separation Assay using Recognition Pairs," U.S. Patent 4,749,647 (6/7/88)

R.C. Nowinski, A.S. Hoffman, R.L. Houghton, J.H. Priest and N. Monji, "Synthesis and Use of Polymers Containing Integral Binding Pairs," U.S. Patent 4,752,638 (6/21/88)

N. Monji, A.S. Hoffman, J.H. Priest and R.L. Houghton, "Thermally-Induced Phase Separation Immunoassay," U.S. Patent 4,780,409 (10/25/88)

A.S. Hoffman and L.C. Dong, "Immobilized Biomolecules and Method of Making Same," U.S. Patent 4,829,098 (5/9/89)

R. C. Nowinski and A.S. Hoffman, "Polymerization-Induced Separation Immunoassays", U.S. Patent 4,843,010 (6/27/89)

A.S. Hoffman and N. Monji, "Methods for Selectively Reacting Ligands Immobilized within a Temperature-Sensitive Hydrogel," U.S. Patent 4,912,032 (3/27/90)

A.S. Hoffman, T.A. Horbett, J. Bohnert, B.C. Fowler and D. Kiaei, "Tight Binding of Proteins to Surfaces," U.S. Patent 5,055,316 (10/8/91)

- W.R. Gombotz, R.J. Mumper, A.S. Hoffman and L.S. Bouchard, "Methods and Compositions for the Oral Delivery of Therapeutic Agents", U.S. Patent 5,451,411 (9/19/95) and European patent 652,015 (3/19/97)
- A.S. Hoffman and N.S. Choi, "Hydrophobically-Modified and Biocompatible Polymer Compositions for Preventing Absorption of Dietary Cholesterol and other Lipids", U.S. Patent 5,597,810 (1/28/97)
- A.S. Hoffman, A.S. Patel and G. Llanos, "PEO-coated Intraocular Lens", U.S. Patent 5,618,316 (4/8/97) (Assigned to UW)
- P.S. Stayton and A.S. Hoffman, "Interactive Molecular Conjugates", U.S. Patent 5,998,588 (12/7/99)
- A.S. Hoffman and Y. Hayashi, "PEGylated Drug Complexed with Bioadhesive Polymer Suitable for Drug Delivery and Methods Relating Thereto", U.S. Patent 6,165,509 (Dec. 26, 2000)
- A.S. Hoffman and G. Chen, "Block and Graft Copolymers and Methods Relating Thereto", patent allowed, European Patent Application no: 95 913 533.6-2115 and U.S. Patent [6,486,213 B1] (11/26/02)
- A.S. Hoffman and N.S. Choi, "Method for Reducing Absorption of Undesired Lipids in the Gastrointestinal Tract", U.S. Patent 6,180,617 (1/30/01)
- A.S. Hoffman, P.S. Stayton, O.W. Press, D.A. Tirrell, N. Murthy, and C. Lackey, "Enhanced Transport Using Membrane Disruptive Agents", US patent 6,835,393 (12/28/04)
- PS. Stayton, AS Hoffman, N Malmstadt, T Shimoboji, S Kulkarni, "Stimuli-Responsive Polymer Devices", U.S. Patent No. 7,625,764 (12/1/09)
- PS** Stayton, AS Hoffman, X Yin, LJ Taite and J Garbern, "Temperature and pH-responsive Polymer Compositions", US Patent No. 7,718,193 (5/18/10)
- PS Stayton, AS Hoffman, JJ Lai, J Hoffman and M Ebara, "Stimuli-Responsive Magnetic Nanoparticles and Related Methods", USP 7,981,688 B2, July 19, 2011
- AS Hoffman, et al., "Enhanced Transport Using Membrane Disruptive Agents", USP 8,003,129, August 23, 2011; also USP 6,835,393 B2, 12 and USPatent # 8,318.816, Nov. 27, 2012
- PS Stayton, AS Hoffman, et al., "STIMULI-RESPONSIVEMAGNETIC NANOPARTICLES AND RELATED METHODS", USP 8,507,283 B2, Aug. 13, 2013
- AS Hoffman, et al., "Enhanced Transport Using Membrane Disruptive Agents", USP 8,846,106, Sept. 30, 2014
- PS Stayton, AS Hoffman, et al., "Polymeric carriers suitable for the delivery of polynucleotides (e.g. oligonucleotides) and/or other therapeutic agents into a living cell", USP 9,006,193, April 15, 2015.

### **Patents Pending**

- A.S. Hoffman, P.S. Stayton and N. Murthy, "Acid-degradable Polymers that Disrupt Lipid Membranes", **patent pending**
- P.S. Stayton, A.S. Hoffman and N. Malmstadt: "Smart Polymers in Microfluidic Devices", several **patents pending**

A.S. Hoffman, P.S. Stayton, et al., "Novel Carriers for Nucleic Acid, Peptide, and Protein Drugs",  
**>15 patents pending**

**THIS LIST OF "PATENTS PENDING" IS NOT COMPLETE AS MANY APPLICATIONS HAVE  
BEEN FILED AND THEY ARE NOT LISTED HERE DUE TO CONFIDENTIALITY  
ISSUES.**