Curriculum Vitae

Peter G. Ruminski

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Summary of Qualifications

Supervisory

- Directs the research activities of interdisciplinary scientists on large project teams within a fast paced matrix environment, leading to the discovery and development of multiple proprietary clinical candidates and significant fundamental scientific advancements.
- Coaches and mentors direct reports and associates, developing careers by maximizing their strengths and productivity and being influential in their mastery of the drug discovery process, allowing them to critically impact the success of project teams.
- Actively manages multiple outside vendors (CROs) to achieve high levels of efficiency via concise design of synthetic schemes, relevant technology transfer, regular correspondence, and expectations of desired outcomes. Vendors include U.S. and ex-U.S. (China, India, Sweden) companies. Overcoming cultural and language differences in a global environment to deliver a quality product is a particularly strong asset.
- Influences the establishment of academic collaborations and external alliances of scientific and strategic merit.

Technical

- Extensive research experience in the biomedical and pharmaceutical sciences with a strong synthetic chemistry and molecular biology background and an exceptional ability to organize and lead cross-disciplinary teams within a matrix environment.
- Discovered and developed proprietary clinical candidates with novel mechanisms of action in oncology, autoimmune and inflammatory diseases, ophthalmology, osteoporosis, and anemia, including advancement into human clinical trials.
- Expert in the design and building of IP small molecule portfolios and the implementation of targeted scientific objectives with a special talent for creativity, problem solving, SAR analysis, internal and external collaboration, conflict resolution, and execution.
- Provides leadership and expertise to the company in the areas of medicinal chemistry, drug design and pharmacology with particular emphasis on the biology/chemistry interface, cell signaling pathways, protein kinases, transcription factors and epigenetic modifications.
- Numerous honors and awards and a record of scientific accomplishment via an extensive list of patents, publications and invited professional symposia presentations.
- Adapts quickly to changing environments and leverages change to exploit new opportunities.
- Skilled in patent writing and interpretation and working with IP counsel to develop and execute chemical IP strategy.
- Articulate in communicating complex ideas across a variety of allied scientific disciplines.
- Consistently delivers high quality results across a wide range of pharmaceutical science programs, ensuring scientific excellence and driving projects toward expected milestones and timelines.

- Exploits structure based drug design and *in vitro* analysis in the optimization of pharmacologic and pharmaceutical properties.
- Represents the company to external audiences via presentations at scientific conferences and community outreach efforts.
- Initiates strategic scientific collaborations with academic researchers,
- Working knowledge of chemical and pharmaceutical software programs.
- Builds collaborative goals with counterparts in Biology and Pharmacology.
- Skilled in the use of analytical methods and instrumentation and creative synthetic techniques.

Professional Experience and Accomplishments

Center for World Health & Medicine 06/2010 – present
Saint Louis University
St. Louis, Missouri
Executive Director

Responsibilities include leading a multidiscipline team of former Pfizer scientists to discover and develop novel therapies directed at neglected and rare diseases, especially those of underserved and poverty stricken populations in the developing world. These efforts include choosing and overseeing disease projects where repositioning of drug assets have potential for a new therapeutic, establishing collaborations with international experts in the various disease targets that are being pursued, forming strategic partnerships with other Institutions that bring complimentary assets to the Center's focus, and attracting funding sources for long term sustainability of the Center.

Pfizer (Monsanto/Searle/Pharmacia) 06/1979 – 04/2010
Worldwide Discovery Medicinal Chemistry and Immunology
St. Louis, Missouri
Associate Research Fellow

Responsibilities included leading cross-disciplinary teams in the design, synthesis and development of biologically active molecules for the therapeutic treatment of select disease targets of commercial interest to Pfizer. A thorough understanding of the principals of pharmacology and toxicology and collaboration with those disciplines in the development of drug candidates was an ongoing role. Additional responsibilities included the supervision and mentoring of associates, as well as being a technical resource to the R&D community. Writing and evaluating patents and working with patent counsel to develop and execute IP strategy was a critical responsibility. Management and integration of external vendors as an efficient resource for project needs became a more prominent role in the execution of milestone goals.

Personal accomplishments:

- Inventor and team leader of a class RGD peptidomimetic antagonists of the avb3 integrin receptor developed as therapeautic agents for oncology and osteoporosis. Rational design

of a series of analogues led to the discovery and development of SD-7784: a novel, potent, long acting and orally bioavailable molecule that entered into human clinical trials. Phase I data demonstrated good tolerability and excellent pharmacokinetic properties, confirming data observed in preclinical models. An externally recognized expert on RGD peptidomimetics and numerous invited talks at scientific conferences have been presented on this body of work.

- Inventor of a potent and highly selective inhibitor (PF-152) of the enzyme MMP13 that was advanced to human clinical trials as a disease modifying agent for osteoarthritis. MMP13 degrades type II collagen, the major structural collagen in joint cartilage. Utilization of crystallography, structure based drug design and combinatorial PK techniques led to this novel drug candidate with exceptional properties and safety. An invited oral presentation was given at the 2009 Winter Conference on Medicinal and Bioorganic Chemistry.

- Led a medicinal chemistry effort designed to disrupt signal transduction of inflammatory cytokine and Toll-like receptors for the treatment of autoimmune disease. Directed associates and external CROs in the design and synthesis of potent and selective antagonists of a key pathway enzyme involved in the activation of NF-kB. Strong collaborations with crystallography and computational chemistry are integral to the rational design of these analogues.

- As an integral member of a pathway mapping and new target identification team, initiated a proposal that emphasized the regulation of transcription factors for the treatment of autoimmune disease and cancer. A specific goal was the therapeutic stabilization and enhancement of T regulatory cells (Tregs) and their ability to suppress autoreactive immune cells. Achievements included : writing a detailed proposal, securing full approval from top management, assembled and led a multidisciplinary team, orchestrating collaboration with and funding for a prominent immunologist and his lab at UCSF, and delivery of initial results to validate the concept. Of particular importance was the precise and facile development of assays to quantify epigenetic changes in Tregs, which also affords a more generic technology platform for other disease targets.

- Project lead in anemia. Responsible for the rational design of inhibitors of HIF prolyl hydroxylase, resulting in the stabilization of the transcription factor HIF, subsequent upregulation of erythropoietin and increased plasma hemoglobin levels. Instrumental in the coordination of *in vitro* and *in vivo* assays and directing a team of internal and external medicinal chemists in identifying novel, highly potent and orally efficacious inhibitors that achieved proof of concept in pre-clinical animal models.

- Co-initiated a program to evaluate the potential of a5b1 integrin antagonists as angiogenesis inhibitors for the treatment of cancer, inflammation, retinopathy and related aberrant angiogenesis pathologies. Synthesized and discovered proprietary and highly potent a5b1 antagonists that were selective against the avb3 and IIbIIIa integrins. Various *in vivo* animal studies utilizing these molecules demonstrated proof of concept in the pathologies listed.

- Chemistry project lead for the development of FLT3 kinase inhibitors for oncology. Discovered a series of select molecules that were potent and highly selective for FLT3

and a small subset of other oncology related kinases, having the potential for targeted therapy with fewer side effects.

- Discovered, via a directed combinatorial chemistry approach, a potent, non-peptide antagonist of the alpha v beta III integrin receptor (SC 56631) which was essential for *in vivo* proof of concept for the treatment of osteoporosis. Included in this accomplishment was the process development and large scale synthesis of this molecule for the relevant in vivo experiments.

- Highly impacted the inducible nitric oxide synthase (i-NOS) program by discovering the most potent i-NOS inhibitor synthesized to date and by achieving the sought after goal of a highly potent i-NOS inhibitor devoid of CYP inhibition and with good PK properties.

- Made key impacts on several additional targets, including the MK2 kinase inflammation project, providing critical synthetic tools to test proof of concept and meet project milestones.

- the conception, development and implementation of a directed synthetic library approach to discovery of pharmaceutical leads. This effort resulted in not only the demonstration of feasibility, which subsequently has been exploited by many others in a much more automated manner, but also led to discovery of novel non-peptide molecules directed against relevant pharmaceutical targets. This was one of the first demonstrations of non-peptide library creation, biological evaluation, and deconvolution (LC/MS/MS) to identify the active lead from the library mixture. An entire industry eventually evolved subsequent to this early work.

St Louis University School Of Medicine 1977 - 1979
St. Louis, Missouri
Research Associate

Principal researcher involved in the investigation of the effect of diet on the composition, distribution and quantification of biliary acids collected from rat bile and any correlation from such analysis as it pertained to colon cancer. Responsibilities included method development, cannulation of and collection of bile from rat bile ducts, animal care and maintenance, and analysis of bile acids collected from the individual experiments.

Educational Background

- Masters degree in Molecular Biology from Washington University, St. Louis, Missouri (1992)

- Bachelors degrees in Chemistry (1975)and in Education (1977) from Saint Louis University, St. Louis, Missouri

- Intensive professional training courses in the "Principles of Molecular Biology, Biochemistry and Pharmacology" at The Center For Professional Advancement in Princeton NJ. (1988).

- ACS course: Pharmacology for Chemists (1992).

- Numerous Pfizer, Monsanto and ACS in-house courses including HPLC, Mass Spec, NMR, GLC and in silico drug design tools as well as courses in effective communication, writing and team leadership.

References

- Dr. Raj Devraj
  Executive Director Medicinal Chemistry, Pfizer
  rajesh.v.devraj@pfizer.com phone: (636) - 247 - 7468

- Dr. Craig Wegner
  Executive Director of Inflammation and Immunology, Pfizer
  craig.d.wegner@pfizer.com phone: (636) - 247 - 8057

- Dr. Joseph McDonald
  Research Fellow and Director of Computational Chemistry, Pfizer
  joseph.mcdonald@pfizer.com phone: (636) - 247 - 7330

Honors and Awards

- 2010 Health Care Hero award by the Saint Louis Business Journal, St. Louis, Missouri

- Lifetime Technical Achievement Award in Medicinal Organic Chemistry (American Chemical Society) (2006)

- Individual Achievement Award for outstanding contributions toward the development and execution of efficient and productive alliances with external vendors in China and India for the synthesis of drug candidiates

- ACE Award for providing support and improved synthetic methodologies for the timely scale up of the avb3 clinical candidate in cancer

- ACE Award for the discovery of a family of avb3 antagonists that meet all potency, oral bioavailability and efficacy criteria as clinical candidates for cancer

- ACE Award for the discovery of novel potent and selective avb3 antagonists with improved bioavailability.

- ACE Award for the discovery and large scale development of SC 56631 as a molecule for the in vivo proof of concept for antagonists of alpha v beta III in the treatment of osteoporosis

Member:

- American Chemical Society
- American Chemical Society – Division of Medicinal Chemistry
- American Association for the Advancement of Science
- Alpha Sigma Nu Honor Society

Publications

Principal investigator and author / co-author:

- **The joint protective effect of a highly selective matrix metalloproteinase 13 inhibitor in a canine model of osteoarthritis is emulated by the combined effect on biomarkers for cartilage degradation** (manuscript approved for submission)

- **Cartilage Degradation Biomarkers Predict Efficacy of a Novel, Highly Selective Matrix Metalloproteinase 13 Inhibitor in a Dog Model of Osteoarthritis** *ARTHRITIS & RHEUMATISM* Vol. 62, No. 10, October 2010, pp 3006–3015

- **Discovery of (pyridin-4-yl)-2H-tetrazole as a novel scaffold to identify highly selective matrix metalloproteinase-13 inhibitors for the treatment of osteoarthritis** *Bioorganic & Medicinal Chemistry Letters* (accepted manuscript)

- **Pilot-Plant preparation of an avb3 integrin antagonist. Part 3. process research and development of a diisopropylcarbodiimide and catalytic 1-hydroxybenzotriazole peptide coupling** *Org. Process Res. Dev.* (2009), 13 (6), 1088-1093

- **R-Isomers of Arg-Gly-Asp (RGD) mimics as potent avb3 inhibitors** *Bioorganic & Medicinal Chemistry* (2007), 15(11), 3783-3800

- **Anti-metastatic properties of RGD-peptidomimetic agents S137 and S247** .*Clinical & Experimental Metastasis* (2004), 21(2), 129-138

- **Pilot Plant preparation of an avb3 integrin antagonist. Part 1. process research and development of a (S)-beta -amino acid ester intermediate: synthesis via a scalable, diastereoselective imino-Reformatsky reaction** *Organic Process Research & Development* (2004), 8(1), 51-61

- **Adenovirus inhibition by peptidomimetic integrin antagonists**
  Antiviral Research (2002), 55(1), 169-178

- **Peptidomimetic antagonists of avb3 inhibit bone resorption by inhibiting osteoclast bone resorptive activity, not osteoclast adhesion to bone**
  Journal of Endocrinology (2000), 165(3), 587-598

- **av Integrins mediate adhesion and migration of breast carcinoma cell lines** *Clin. Exp. Metastisis* 1998, Vol 16, No 1 50-61

- **A Peptidomimetic antagonist of the integrin avb3 inhibits leydig cell tumor growth and the development of hypercalcemia of malignancy** *Cancer Research* 58, 1930-1935, May 1,1998

- **A Peptidomimetic antagonist of the avb3 integrin inhibits bone resorption in vitro and prevents osteoporosis in vivo** *J. Clin. Invest.* 99 (9), 2284-2292, 1997

- **A peptidomimetic antagonist of the integrin avb3 inhibits tumor growth and hypercalcemia** *Journal of Bone and Mineral Research,* 12:5689, 1997

- **Antiangiogenic and anticancer activities of antagonists of integrin avb3** *Proceedings of the American Association for Cancer Research* 38: 1389, 1997

- **Progress and future directions of beta-3 integrin research** *American Chemical Society abstracts* MEDI 253, 210, (1-2), 1995

- **Prevention of oophorectomy-induced bone loss by a non peptide antagonist of the osteoclast integrin, avb3** *Journal of Bone and Mineral Research,* 10:52a, 1995

- **Derivatives of 3,4,4-trifluoro-but-3-ene-amine and their use as potent downward systemic nematicides** *American Chemical Society abstracts* AGRO 3, 207, (1-2), 1994

- **Specificity of pyridine monocarboxylates and benzoic acid analogues as chemical hybridizing agents in wheat** *Journal of Agriculture and Food Chemistry* , 1991, Vol. 39, No. 11, pp. 2072 - 2076

- **Specificity of pyridine monocarboxylates and benzoic acid analogues as chemical hybridizing agents in wheat** *TCM Journal,* 1991, Vol. 1, N0. 1, pp. 33 - 40

- **Synthesis of alkyl N-cyano-N-substituted carbamates and N,N-disubstituted cyanamides** *Phosphorus and Sulfur,* 1987, Vol. 29, pp. 219 - 226

- **Synthesis of alkyl N-cyano-N-substituted thiolcarbamates** *Phosphorus and Sulfur,* 1987, Vol. 29 (1), pp. 1-10

- **Synthesis of 3-(2-benzothiazolylthio)propanenitrile and related products** *J. Heterocyclic Chem.,* 23 (6), 1629-1635 (1986)

- **Heterocyclic and related compounds derived from dipotassium 1,1-dimercapto-2,2-dicyanoethylene and sodium 2-mercaptopyridine N-oxide** *Phosphorus and Sulfur,* 1985, Vol. 21, pp. 307 - 314

- **Synthesis of 2-thioxo-3-benzothiaolineacetonitrile and related products** *J. Heterocyclic Chem.,* 22 (6), 1479-82 (1985)

- **Synthesis of heterocyclic compounds from dipotassium 1,1-dimercapto-2,2-dicyanoethylene** *Phosphorus and Sulfur,* 1984, Vol. 20, pp. 251 - 257

- **Synthesis of heterocyclic compounds and new routes for the preparation of certain dithiocarbonates and sulfides from potassium cyanodithioimidocarbonate** *Phosphorus and Sulfur,* 1984, Vol. 19, pp. 335 - 344

- **Synthesis of 1-cyano-2-methylisoindole. A new route to isoindoles** *J. Heterocyclic Chem.,* 20 (5), 1283-1286 (1983)

- **Role of diet on composition of rat bile** *Federation Proceedings,* Vol. 36, 1143, 1977

Patents

Sole or co-inventor on the following patents:

- **Preparation of pyrimidine and pyridine derivatives as antiinflammatory agents**
  WO Patent 2009016498

- **Hetero bicyclic carboxamide derivatives, processes for preparing them, pharmaceutical compositions containing them, and their uses as inhibitors of matrix metalloproteinase enzymes** *WO Patent 2008149191*

- **Preparation of beta -amino acid R-isomer compounds as integrin receptor antagonists**
  WO Patent 2004060376

- **Preparation of peptidyl integrin antagonists for use in combination with a chemotherapeutic agent for treatment of neoplasia**
  US Patent 6372719

- **Preparation of peptidyl integrin antagonists for use in combination with a chemotherapeutic agent for treatment of neoplasia**
  WO Patent 2000051686

- **Preparation of [[[[(pyrimidinylamino)benzoyl]amino]acetyl]amino]benzenepropanoic acid derivatives as avb3 integrin antagonists**
  US Patent 6013651

- **Preparation of heterocyclic glycyl beta -alanine derivatives as vitronectin antagonists**
  WO Patent 9952896

- **Preparation of 3-hydroxy-5-[(1,4,5,6-tetrahydro-5-hydroxy-2-pyrimidinyl)amino]benzoic acid**
  WO Patent 9944996

- **Preparation of meta-pyrimidinylamino benzamides and derivatives as avb3 integrin antagonists**
  WO Patent 9944994

- **Preparation of cinnamic acid derivatives for selective inhibiting or antagonizing the avb3 integrin**
  US Patent 5852210

- **Preparation of 3-guanidinophenylamides and related compounds as integrin avb3 inhibitors or antagonists**
  US Patent 5773646

- **Platelet aggregation inhibitors**
  US Patent 5798370

- **New vitronectin receptor antagonizing amino-benzoic acid derivatives used to treat e.g. tumor metastasis, solid tumor growth, angiogenesis, osteoporosis, smooth muscle migration and rheumatoid arthritis**
  WO Patent 9708145

- **Guanidinoalkyl glycine beta-amino acids useful for inhibiting tumor metastasis**
  US Patent 5681820

- **Guanidinoalkyl glycine beta-amino acids useful for inhibiting bone loss**
  US Patent 563976:

- **Benzamido phenyl or phenoxy acetic and propionic acids for use in arthritis, tumor growth and metastasis, osteoporosis, etc.**
  WO Patent 973686

- **New guanidino phenyl styryl alkenoic acids for use in arthritis, tumor growth and metastasis, osteoporosis, restenosis, etc.**
  WO Patent 9736860

- **Benzamido phenyl propionic and phenoxyacetic acids for use in arthritis, tumor growth and metastasis, osteoporosis, restenosis, etc.**
  WO Patent 9736859

- **Platelet aggregation inhibitors**
  US Patent 5602155

- **Guanidino alkylamino carbonyl alkyl carbamido alkanoic acid derivatives are platelet aggregation inhibitors used in thrombosis, stroke, infarction, arteriosclerosis, inflammation, metastasis, etc.**
  WO Patent 9623771

- **Fluoroalkenyl compounds and their use as pest control agents**
  US Patent 5811578

- **Fluoroalkenyl compounds and their use as pest control agents**
  US Patent 572347:

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 571451:

- **Fluoroalkenyl compounds and their use as pest control agents**
  US Patent 5708032

- **New 4,4-difluoro-but-3-enyl esters of carboxylic acid, useful as pesticides in plant protection**
  WO Patent 9708130

- **New N,N-disubstituted 4-bromo-3-chloro-3,4,4-trifluoro-butanamide- used to control nematodes, insects and acarids in agricultural crops, and glycine derivative, intermediate for trifluorobutene compounds**
  US Patent 5700840

- **Fluoroalkenyl compounds and their use as pest control agents**
  US Patent 562717:

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 5693865

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 562308:

- **New 3,4,4-trifluorobutenoic acid derivatives useful for controlling nematode, insect and acarid infestation of plants**
  US Patent 551471

- **New fluoro substituted alkenyl ether and thioether compounds useful as pesticides in plant protection**
  WO Patent 9619449

- **New fluoro substituted butenyl ester compounds useful as pesticides in plant and material protection and veterinary medicine**
  WO Patent 9614289

- **New fluoro butenyl carbonate and carbamidate compounds useful as pesticides in plant protection**
  DE Patent 443933:

- **Preparation of difluorobutenyloxy acetate and difluorobutenyl thioacetate derivatives as pesticides**
  DE Patent 4445792

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 5561162

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 5457134

- **Fluoroalkenyl compounds and their use as pest repellents**
  US Patent 5389680

- **Fluoroalkenyl compounds for nematode, insect and acarid control**
  WO Patent 921555:

- **Preparation of fluoroalkenyl group containing compounds as pesticides**
  CN Patent 1064479

- **2,6-bis(trifluoromethyl)-3-hydroxy carbonyl pyridines as gametocides**
  US Patent 4747871

- **2,6-bis (trifluoromethyl)-3-methoxycarbonyl-4-hydroxy pyridines as gametocides**
  EP Patent 276204

Books

- **Synthesis of alkyl N-cyano-N-substituted carbamates, thiolcarbamates, and N,N-disubstituted cyanamides** Chapter 32 of *Synthesis and Chemistry of Agrochemicals,* ACS symposium series 355, American Chemical Society, Washington, DC, 1987.

External Presentations

Invited talks:

- **Design of orally active and highly specific matrix metalloproteinase-13 inhibitors for the treatment of osteoarthritis** 2009 Winter Conference on Medicinal and Bioorganic Chemistry Steamboat, Colorado Jan. (2009)

- **Synthetic challenges in the development of peptidomimetic antagonists of the avb3 integrin receptor** 232nd ACS National Meeting San Francisco, California Sept. (2006)

- **Potent, selective, and orally active antagonists of integrin avb3 as tumor angiogenesis inhibitors: The discovery of the S 257- class of integrin antagonist** 221st ACS National Meeting San Diego, California April (2001)

- **Peptidomimetic antagonists of the avb3 integrin receptor as inhibitors of angiogenesis and their efficacy in preclinical animal models of cancer** 219th ACS National Meeting San Francisco, California March (2000)

- **Peptidomimetic antagonists of the avb3 integrin receptor as inhibitors of angiogenesis** ACS Midwest Regional Meeting St. Louis, Missouri Oct. 2000

- **Peptidomimetic antagonists of the avb3 integrin receptor and their in vivo efficacy in animal models of cancer.** 218th ACS National Meeting New Orleans, Louisiana Aug. (1999)

- **Potent, selective peptidomimetic antagonists of the AVB3 integrin and their in vivo efficacy in models of osteoporosis and cancer** 217th ACS National Meeting Anaheim, California March (1999)

- **Derivatives of 3,4,4-trifluoro-but-3-ene amine and their use as potent downward systemic nematicides** ACS National Meeting San Diego, California March (1994)

- **Specificity of pyridine monocarboxylates and benzoic acid analogues as chemical hybridizing agents in wheat** ACS National Meeting San Francisco, California April (1992)

Session Chair:

- **Integrin antagonists as pharmaceutical therapeutics** ACS National Meeting, Division of Medicianl Chemistry Washington, D.C. August (2000)

Additional external presentations and posters:

- **Synthesis of potent and selective nonzinc binding matrix metalloproteinase-13 inhibitors**
  237th ACS National Meeting Salt Lake City, Utah March (2009)

- **Discovery of highly selective matrix metalloproteinase-13 inhibitors for the treatment of osteoarthritis** 237th ACS National Meeting Salt Lake City, Utah March (2009)

- **Design of highly selective matrix metalloproteinase-13 inhibitors for the treatment of osteoarthritis** 237th ACS National Meeting Salt Lake City, Utah March (2009)

- **Synthesis, tissue distribution and recovery of 14C labeled avb3 inhibitors**
  . Synthesis and Applications of Isotopically Labelled Compounds, Proceedings of the International Symposium, 8th, Boston, Massachusetts June (2003)

- **Design, synthesis, and oral efficacy of novel vitronectin receptor antagonists in tumor models** 221st ACS National Meeting San Diego, California April (2001)

- **avb3 antagonists inhibit tumor growth in models of rodent and human cancer** American Association of Cancer Research special conference on angiogenesis and cancer Jan. (1998)

- **Selective avb3 antagonist as a potent inhibitor of angiogenesis** American Association of Cancer Research March (1998)

- **Inhibition of tumor growth and metastasis by an avb3 integrin antagonist** American Association of Cancer Research March (1998)

Internal Presentations

- **The discovery and development of SD-7784, a potent, selective, and orally active antagonists of integrin avb3 as a tumor angiogenesis inhibitor** Pharmacia Medicinal Chemistry Symposium Kalamazoo, Michigan Sept. 2000

- **Potent, orally active avb3 antagonists: from directed library leads to PA candidate** Searle Seminar Series Skokie, Illinois Oct. (1997)

- **Potent and selective inhibitors of the avb3 integrin receptor** TCM Tech May (1996)

- **Inhibitors of the RGD - based integrin alpha v beta III in models of bone resorption and osteoporosis** poster presentation Monsanto/Searle Fellow Symposium Fall (1994)

- **Development of synthetic combinatorial libraries for the discovery of pharmaceutical leads** TCM Tech May (1994)

- **Synthesis of potent non-peptide antagonists of the alpha v beta III integrin receptor** TCM Tech May (1993)

- **Derivatives of 3,4,4-trifluoro-but-3-ene as downward systemic nematicides** TCM Tech May (1990)

- **Pyridine monocarboxylates and benzoic acid analogues as chemical hybridizing agents in wheat** TCM Tech May (1988)