

Corporate Presentation

*Transforming Discovery Research into Innovative Medicines through
Value-Based Partnership*



***CreaGen, Inc.
299 Washington Street
Woburn, MA 01801***



CreaGen, Inc.

Our Goal is to
“Create A New Generation of Small Molecules”
Through efficient and value-driven partnerships

Vision

- Offer true collaborative services to biotech, pharmaceutical companies and Federal Research Institutes to accelerate their discovery programs
- Build our reputation by exceeding customer expectations

Resources

- Established in 2003
- Corporate Headquarters: 299 Washington Street, Woburn, MA
- Scientists: Fifteen experienced chemists total, many with more than ten years in the pharmaceutical industry
- Existing laboratories: ~ 25,000 sq feet: newly expanded in January 2018
- Equipment: Waters LC-MS, Varian NMR (300 MHz), Waters auto purification system, Agilent analytical and Preparative HPLCs, Isco Combi-flash systems, TCAMs for parallel synthesis, Microwave synthesizer, Genevac evaporators, SFC Chiral Chromatography
- Library accessibility: online journal subscriptions, SciFinder and Beilstein/Crossfire access

Team

- **Raj (SB) Rajur, PhD, Founder & CEO**
30 Years of academic, industrial and management experience: ArQule, Millipore, Boston College, Northeastern University, Massachusetts General Hospital and Harvard Medical School
- **Hwa-OK Kim, PhD, Sr. Director of Chemistry**
30 Years of industrial and management experience: Aurigene Discovery Technologies, Molecumetics, Marion Merrell Dow and New Mexico State University
- **James Siedlecki, PhD, Sr. Director of Medicinal Chemistry**
20 Years of industrial and project management experience: ArQule, Cubist, AstraZeneca, Syndexa, Immunexcite, North Carolina state University
- **Naveen Rajur, Director of Business Development**
Business development, finance: Crest Point, Morgan Stanley, University of Southern California, Marshal School of Business management
- **Vimal Raheja, MBA, CPA, Financial officer**
25 years of experience in finance and accounting, Bentley College, member of the American Institute of Certified Public Accountants and member of the Massachusetts Society of Certified Public Accountants
- **Anny Chum, Director of Operations & Administration**
20 Years of operational, management and administrative experience: small business owner, University of Massachusetts Lowell, Middlesex community college

SAB Team

- **Norton P. Peet, PhD,**
40 Years of industrial and management experience: Aurigene Discovery Technologies, ArQule, Aventis, Marion Merrell Dow, University of Nebraska and Massachusetts Institute of Technology
- **Robert Perni, PhD,**
30 years of industrial and management experience: Vertex Pharmaceuticals, Sirtris Pharmaceuticals, Sterling Winthrop, Avid Therapeutics, Dartmouth College, Northeastern University, University of Rochester
- **Mark Tebbe, PhD,**
30 years of Industrial and management experience: Co-founder of Quench Bio with Atlas Venture and of Arix Bioscience, EIR at Atlas Ventures, Quartet Medicine, Forma Therapeutics, Eli Lilly, Stanford University and University of Notre Dame.
- **Vinod Patel, PhD,**
25 years of industrial experience: Founder, TME therapeutics, Amgen, Kinetix pharmaceuticals, Sanofi-Genzyme and University of Nottingham.

Expertise

Medicinal Chemistry:

- Small Molecules, High Throughput parallel library synthesis and purification
- Lead Generation and Lead Optimization
- Conjugation Chemistry, Antibody Drug Conjugates (ADC)
- Macrocycles and Macrocyclic libraries. Cyclic peptides
- Nucleosides and Nucleotides, Peptides and Peptide Nucleic Acids (PNA)
- Carbohydrates and unnatural amino acids

Analytical Chemistry:

- High Throughput purification and analysis

Why Collaborate with CreaGen

- CreaGen is a US based company located in Massachusetts
- CreaGen has an established track record with biotech and large pharmaceutical organizations
- Interdisciplinary strengths at CreaGen ensure that customers receive the best value for their investment

CreaGen's Competitive Advantage:

- Flexibility, competitive pricing and fast turnaround time
- Dedicated project teams and segregation of projects
- Special request capabilities
- Automated parallel synthesis and separations
- Customized data input and output
- Multiple sample delivery formats: dry, in solution, standardized amounts/concentrations, multiple copies, etc.

Services

CreaGen performs services that are:

- project-based
- FTE-based
- collaboration-based

- Medicinal chemistry and lead optimization
- Building blocks/scaffolds/key intermediates
- Customer tailored focused libraries
- High throughput purification and QC solutions

Case studies: Representative Examples

CS I: Multinational Pharma (Oncology) : Lead Optimization

Project requirements:

- Design and optimize leads, synthesize novel analogs of the leads for weekly screening
- Provide all medicinal chemistry expertise to client in designing new analogs and libraries. Explore new synthetic routes.

Accomplishments:

FTE based collaboration

- Provided more than 600 compounds and many novel scaffolds during the tenure of the program. True extension of customer's chemistry program

CS II: Multinational Pharma : Antibody Drug Conjugates (ADC)

Project requirements:

- Design and synthesize novel linkers. Conjugate novel small molecules and drug candidates to linkers. Introduce reactive functionalities on the linker to conjugate to antibodies.
- Provide conjugation chemistry expertise to client. Synthesize libraries of small molecules. Explore new synthetic routes.

Accomplishments:

FTE based collaboration

- Provided several conjugates to client for screening. Developed several novel hydrophilic molecules to conjugate to antibodies to minimize aggregation. True extension of customer's ADC program

Case studies: Representative Examples

CS III: Biotech. (Oncology):

Project Requirements:

- Design and synthesize lipid carrier molecules containing Linoleyl groups.
- Synthesize novel MC3 Lipid analogs
- Provide multi-gram quantities of final analogs for in vivo studies
- Perform process development for multi-step synthesis of Lipids

Accomplishments:

- FTE based collaborations: Provided 20 new linkers and several lipid conjugates on multigram scale for *in vivo* tox studies

CS IV: Biotech. (Anti-infective): Lead Optimization

Project requirements:

- Function as medicinal chemistry department
- Provide all medicinal chemistry expertise to client in designing new analogs
- Develop SAR and interpret weekly screening results with client and suggest new ideas

Accomplishments:

- Expanded collaboration to 8 FTEs: company sold to Biota Australia

Case study: Representative Examples

CS V: NIH

a) NCATS: Synthesis of commercial preclinical candidate

Project requirements and accomplishments:

- Synthesis of 10 grams of ERK inhibitor
- Completed the synthesis within budget and delivered the compound on time.

b) NCI: Synthesis of commercial preclinical compound

Project requirements and accomplishments:

- Synthesis of 10 grams of MMP inhibitor
- Completed the synthesis and delivered the product on time

Case studies: Representative Examples

CS VI: Small Biotech (Diabetes): Lead Optimization

Project requirements:

- Function as *de facto* medicinal chemistry department
- Provide all medicinal chemistry expertise starting with design discussion, literature searches, hit-to-lead evaluation, SAR studies, lead optimization, identification and selection of high-value preclinical candidates

Accomplishments:

- Generated IP for their AMPK program in seven months
- Provided a nanomolar compound and several backup compounds with activities in the micromolar range
- Expanded to 4 FTEs
- Project grew as milestones were delivered and the program was licensed to Debiopharma

Small Molecule Library Synthesis (examples)

Partner	Biotech	Multinational Pharma	Small Biotech
Project	Hit to Lead	Hit to Lead Optimization	Exploratory to Hit/Lead
Duration	2.5 years	3.5years	2 years
FTEs involved	1~1.5	2~4	2~4
# of compounds	750	600	2500
library synthesis: Synthetic steps	1~3	6~7	5~6
Library synthesis Method	solution phase parallel synthesis	solution phase parallel synthesis	solution phase parallel synthesis
Qty of compounds	10-20mg	Ave 50mg	Ave 20mg
Qty for scaffolds /intermediates	2g to 50g	1g to 100g	1g to 30g
Purity	90 to 98%	90 to 98%	90 to 98%
Analytical data	¹ H NMR, ¹³ C NMR, 2D NMR, LC-MS, HPLC, elemental analysis, HRMS etc	¹ H NMR, ¹³ C NMR, LC-MS, HPLC, elemental analysis, HRMS etc	¹ H NMR, ¹³ C NMR, LC-MS, HPLC, elemental analysis HRMS etc
Resulted in	Lead Optimization	Filed patent: _ Lead Optimization	Filed patent: _ Lead Optimization

CreaGen Synthesized Compounds: Various Stages in Partner Programs

Partner	Therapeutic Area	Lead Discovery	Lead Optimization	Clinical Candidate	Phase I, II & III
Multinational Pharma	Cancer				
Biotech	Diabetes				
Biotech	Anti-infective				
Biotech	Anti-infective				
Biotech	Cancer				
Biotech	Cancer				
Biotech	CNS				
Asian Biotech	Cancer				
European Pharma	Diabetes				

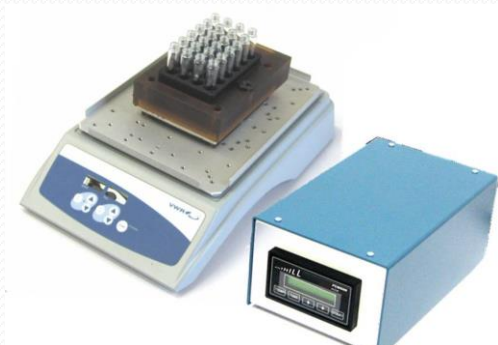
CreaGen Infrastructure & Equipment

CreaGen parallel synthesis platform



CreaGen parallel synthesis work stations

- 1, 2 and 4 position heater/shakers
- Heating up to 150°C
- Variable speed vortexing
- Timed shutoff
- Integration with automation



Synthesis work stations: cont'd



Parallel synthesizer



High speed evaporator
GeneVac (EZ₂)

CreaGen purification work stations



Mass directed purification



Chiral purification: SFC

CreaGen analytical work stations

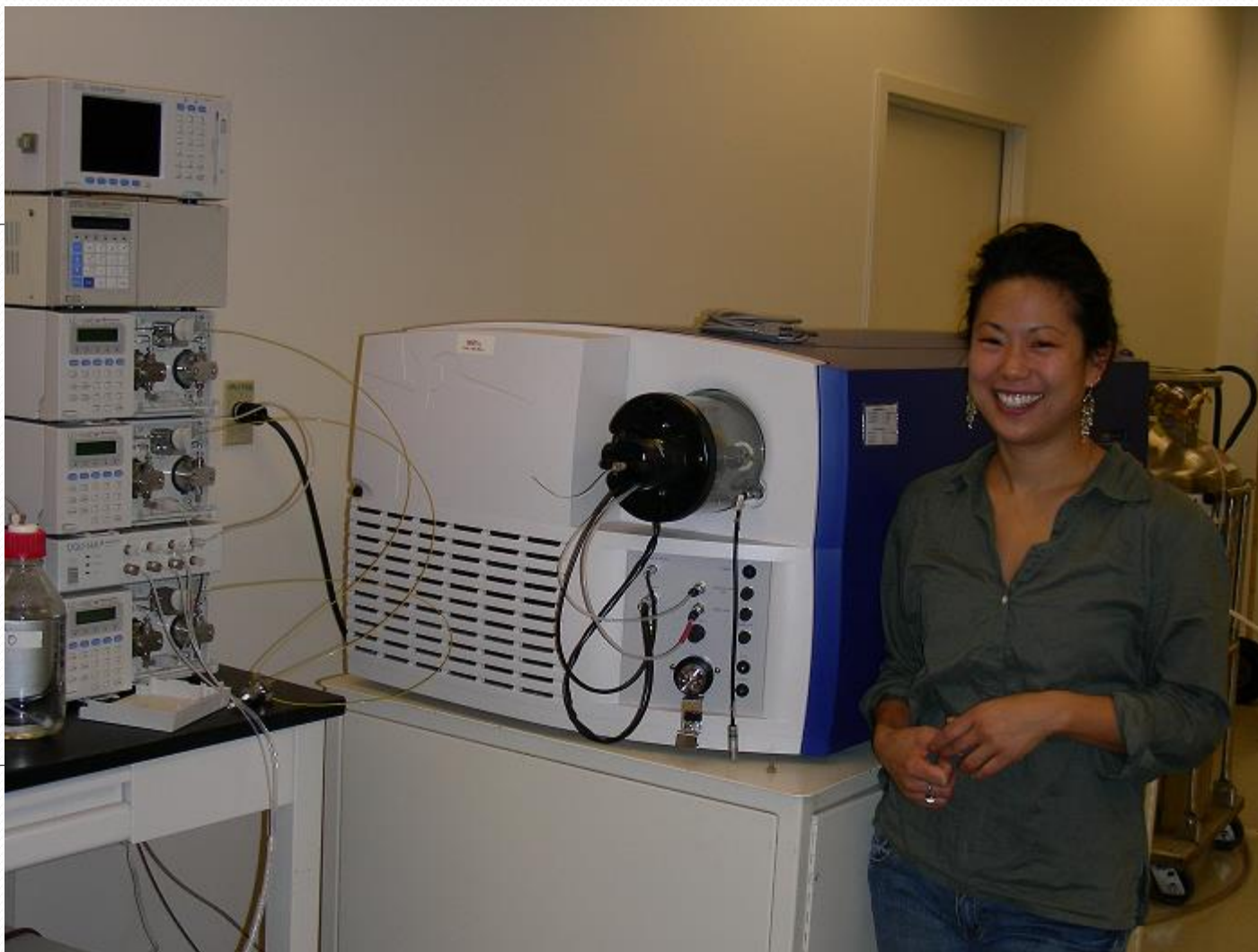


Varian, 300 MHz NMR



TQ- LCMS

CreaGen: LCMS



Summary

- Competitive pricing
- Excellent communication
- Quality services
- On-time delivery
- Customer satisfaction