Title: Develop Center for Molecular Therapeutics

Background and Significance: There is an increasing demand to develop drugs to a variety of diseases and especially neglected and orphan diseases. However, the cost of developing new drugs and the alarming rates of failure of drugs at clinical trials have impeded drug discovery efforts by many pharmaceutical industries. This has encouraged several universities to increase their academic drug discovery programs with BOLD experiments that include significant use of the “omics” technologies, high throughput in vitro techniques integrated with in silico screening techniques. In addition, repurposing of FDA approved drugs to treat neglected diseases have gained significant interest among academic drug discovery groups. With several successful early stage drug candidates emerging from academic drug discovery groups, pharmaceutical industries have evolved to fill their drug pipelines with lead candidates licensed from public-private partnerships with Universities.

Goals and Objectives: The overall goal of the Center for Molecular Therapeutics is to encourage exchange of ideas, resources and knowledge among stakeholders from across all departments of DUCOM to promote collaborative drug discovery efforts and to enhance the visibility of lead candidates pipeline developed at DUCOM.

Methods/Approach and Evaluation strategy: The method used to develop the Center for Molecular Therapeutics includes a) discussion of strategies with Drs. Brian Wigdahl, Olimpia Meucci and Noreen Robertson b) developing an advisory board comprising of individuals with pharmaceutical and biotechnology industry experience, academic drug discovery and development expertise c) identify major stakeholders who will become active members of the center d) develop web portal with information on DUCOM lead pipeline, resources for drug discovery and preclinical development e) compile educational resources available for postdoctoral and graduate students interested in a career in drug discovery and development.

Outcomes achieved/expected: Ongoing discussions with Drs. Wigdahl, Meucci and Robertson has lead to development of a framework for Center for Molecular Therapeutics which will be a center for excellence within the Institute for Molecular Medicine and Infectious Diseases but with shared governance by Departments of Microbiology and Immunology; Pharmacology and Physiology. Currently we are interviewing major stakeholders and developing DUCOM lead molecule Pipeline.

Conclusion and overall impact: Development of the Center for Molecular Therapeutics is a major initiative which involves active participation from major stakeholders with administrative support. During the faculty launch period we plan to develop the framework for the center and lay the foundation for showcasing our current strengths in small molecule therapeutics across the college of medicine. Beyond the launch period we anticipate this project to grow into an institutional resource for faculty, staff and students to engage in academic drug discovery.

Center for Molecular Therapeutics

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Mission and Goals

Mission: Catalyze and enhance discovery and development of Molecular Therapeutics.
The overall goal of the Center for Molecular Therapeutics is to encourage exchange of ideas, resources, and knowledge among stakeholders from across many departments of the College of Medicine and the Drexel University at large to promote collaborative drug discovery efforts and to enhance the visibility of lead candidates pipelines developed within Drexel.

Background and Significance

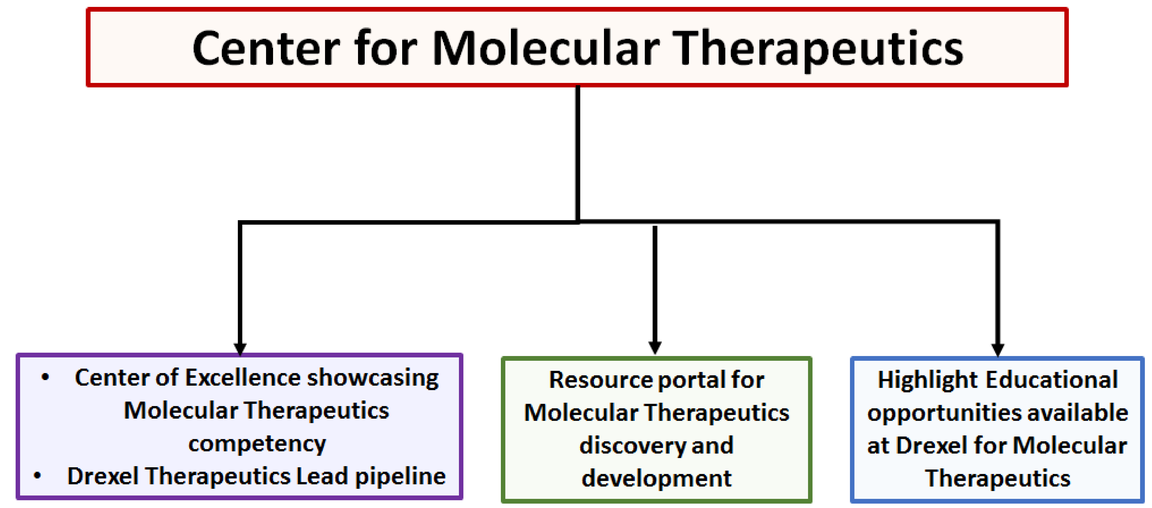
There is an increasing demand to develop drugs to a variety of diseases and especially neglected and orphan diseases. However, the cost of developing new drugs and the alarming rates of failure of drugs at the point of clinical trials have impeded drug discovery efforts by many pharmaceutical industries and caused many to narrow their research spectrum. This has encouraged a number of universities to increase their academic drug discovery programs with BOLD experiments that include significant use of the "omics" technologies involving high throughput in vitro techniques integrated with in silico screening techniques. In addition, repurposing of FDA approved drugs to treat neglected diseases have gained significant interest among academic drug discovery groups. With several successful early stage drug candidates emerging from academic drug discovery groups, pharmaceutical industries have evolved to fill their drug pipelines with lead candidates licensed from public-private partnerships with Universities.

Objectives

The overall objective is to develop the Center for Molecular Therapeutics at Drexel University. This is a multiyear project that involves several stakeholders. Hence during the Faculty Launch project period we plan to develop the overall framework for the Center for Molecular Therapeutics. Our achievable goals for developing the framework includes

(a) discussion of strategies with Drs. Brian Wigdahl, Olimpia Meucci, Noreen Robertson and Paul McGonigle
(b) developing an advisory board comprising of individuals with pharmaceutical and biotechnology industry experience, academic drug discovery, and development expertise
(c) identify major stakeholders who will become active members of the center
(d) develop a web portal with information on the Drexel lead pipeline, resources for drug discovery, and preclinical development
(e) compile educational resources available for postdoctoral, graduate students and staff interested in a career in drug discovery and development.

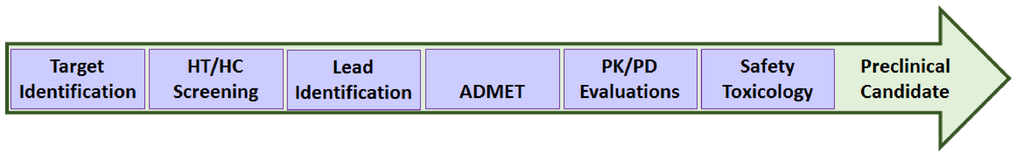
Framework for Center for Molecular Therapeutics



Center of Excellence on Molecular Therapeutics

- Catalyze and encourage collaborations for enhancing translational research
- Identify common needs/resources for developing molecular therapeutics
- Promote partnerships with Pharmaceutical and Biotech industries
- Promote interactions with other centers for molecular therapeutics through monthly seminars/webinars and annual conference
- Develop a central resource that can be cited on institutional grants, program projects, mentored and individual grants

Small Molecule Discovery



- Develop list of techniques and technologies for each step
- Develop industry standard checklist of experiments
- Develop list of contract research organizations – local and global resources
- Link resources for developing a confidential and non-confidential pitch deck

Drexel Lead pipeline template

Lead	Indication	Team	Therapeutic Target	Licensed	Publication (PMIDs)
21A092	Malaria	Akhil Vaidya, Sandhya Kortagere	PfATP4	MMV	20426475; 25422853
PCT3010	Parkinson's Disease	Sandhya Kortagere	DRD3	Polycore Therapeutics LLC	22547031; 27801563; 25896768

Educational resources

Drexel university has various educational programs and courses on molecular therapeutics in various flavors across the various departments and schools. However students and staff who are interested in developing expertise in these areas are unaware of these courses or have faced challenges such as semester versus quarter system to take advantage of the training. One of the objectives of center for molecular therapeutics is to provide a detailed list of courses from graduate as well as professional studies to help faculty, students and staff on developing expertise in the area of molecular therapeutics discovery and development. Examples of programs and courses -

1. Drug Discovery and Development
2. Clinical Research
3. Biomedical Technology and Commercialization
4. Structural Bioinformatics

Challenges

Some of the challenges that I have faced and foresee in the development of Center for Molecular Therapeutics are

1. Lack of complementary expertise among faculty – lack of medicinal chemistry expertise within Drexel University
2. Faculty working within silos and unwilling to participate
3. Lack of funding to develop in-house resources, training facilities and providing service
4. Need better integration of basic, translational and clinical research

Outcomes and Impact

Outcomes achieved/expected: Ongoing discussions with Drs. Wigdahl and McGonigle has lead to the development of a framework for Center for Molecular Therapeutics which will be a Center for Excellence within the Institute for Molecular Medicine and Infectious Diseases but with shared governance by faculty in the Departments of Microbiology and Immunology,; Department of Pharmacology and Physiology, and other basic and clinical science departments in the College of Medicine as well as other academic units from across the University. Currently we are interviewing major stakeholders and developing a robust Drexel lead molecule Pipeline.
Conclusion and overall impact: Development of the Center for Molecular Therapeutics is a major initiative which involves active participation from major stakeholders with administrative support. During the faculty launch period, we plan to develop the framework for the Center and lay the foundation for showcasing our current strengths in small molecule therapeutics across the college of medicine. Beyond the launch period, we anticipate this project to grow into an institutional resource for faculty, staff and students to engage in academic drug discovery.