



**McMaster Children's  
Hospital**



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# **Basic Sciences Research**

**in the**

**Department of Pediatrics**

**Dr. Sandeep Raha, McMaster University**

# What is Basic Research

- Focused on understanding mechanisms of disease, current basis of therapeutic strategies, the development of novel therapeutic strategies
- Involves *in vitro* as well as animal based models
- Generally serves as the foundation for most clinical research



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# Investigators Involved in Basic Research in the Department of Pediatrics



**Leslie Berry**

- Blood coagulation and development of surface treatments for catheters and stents



**Dr. Anthony Chan**

- Characterization of antithrombin-heparin complex
- Development of anticoagulants



**Dr. Christoph Fusch**

- Placental and development and function
- Early origins of disease



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## Dr. Sandeep Raha

- Maternal obesity and placental function
- In utero programming of obesity and its co-morbidities



## Dr. Elyanne Ratcliffe

- Complications of innervation contribute to the pathogenesis of disorders of gastrointestinal motility.



## Dr. Shelia Singh

- Understanding the molecular signaling behind how abnormal stem cells may drive the formation of brain tumours



## **Dr. Mark Tarnopolsky**

- Evaluate mechanisms behind muscle function in genetic diseases as well as aging with a focus on mitochondrial function.
- Evaluate exercise and nutraceutical based therapies



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## **Dr. Constantine Samaan**

- Fatty acids, immunology and muscle function using cell culture models



## **Dr. Brian Timmons**

- The research program at the Children's Exercise & Nutrition Centre (CENC) is devoted to studying the interaction of exercise and nutrition in the context of healthy growth and development.
- Understand the molecular mechanisms that translate physical activity into optimal growth and development.



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# General Areas of Basic Science Focus within Department of Pediatrics

## Condition:

1. Obesity
2. Aging
3. Pregnancy
4. Cancer
5. Pediatric Growth & Development



## Tissues:

1. Bone
2. Muscle
3. Gut
4. Placenta
5. Brain
6. Blood

## Available Tools

QPCR  
Electrophoretic Equipment  
Plate Readers-Immuno Assays  
Spectrophotometers  
Mass Spec/GC-MS  
Biohood/Level 2 Cell Culture  
Live Cell, Brightfield, fluorescence Microscopy  
Cryotome-immunohistochemistry

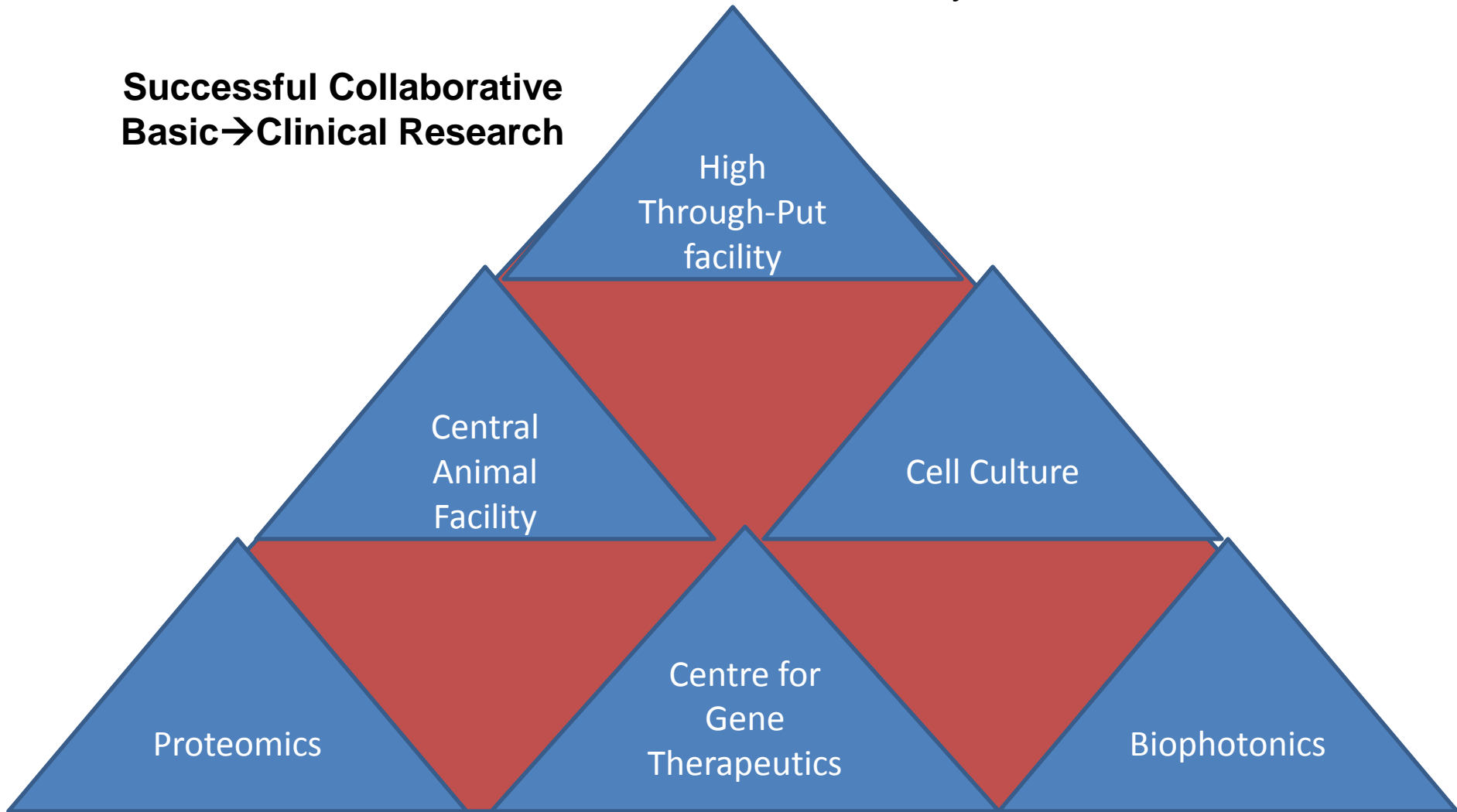


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# Types of Basic Science Approaches Available To the McMaster Community

**Successful Collaborative  
Basic→Clinical Research**



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