Your Summer Research at FOMD

Think Boldly
Dream Big
Be Responsible
Elena Posse de Chaves, Ph.D.
Professor of Pharmacology and Neuroscience
Phone: 780-492-5966
Email: elena.chaves@ualberta.ca
What Can You Expect from your Summer Research?

I have no idea what's going to happen. And I love it.
Why would you spend your summer doing research?

I did it last year and I loved it!!!

I need a job

I need a letter of recommendation for my future school application

I want to know how scientific research really works

I envision pursuing a career in research
What can you get from a Summer Research at FOMD?

Learn how science really works
HOW SCIENCE REALLY WORKS

Scientific Method (1 serving)

1. Ask a question.
2. Formulate a hypothesis.
3. Perform experiment.
4. Collect data.
5. Draw conclusions.

Bake until thoroughly cooked.
Garnish with additional observations.
The Real Process of Science

- **Testing Ideas**
- **Exploration and Discovery**
- **Benefits and Outcomes**
- **Community Analysis and Feedback**

http://www.understandingscience.org
There are many routes into the process of Science

http://undsci.berkeley.edu
Scientific testing is at the heart of the process.

http://www.understandingscience.org
The scientific community helps ensure science’s accuracy

http://www.understandingscience.org
The process of science is intertwined with society
The Process of Science is not pre-determined
What can you get from a Summer Research at FOMD?

- Learn how science really works
- Enrich your perspective on scientific medical research
Canada’s Health Research Enterprise

http://www.cihr-irsc.gc.ca/e/48964.html
What can you get from a Summer Research at FOMD?

- Learn how science really works
- Enrich your perspective on scientific medical research
- Find out that this is your way to change the world
Your Summer Research at FOMD

Think Boldly
Dream Big
Be Responsible
“Research is to see what everybody else has seen, and to think what nobody else has thought.”

— Albert Szent-Györgyi (1893 – 1986) Physiologist and Nobel Prize recipient
You are trying to answer an important scientific question
Your work will represent an important piece of the puzzle.
The summer research program offers opportunities to:

**Improve your organizational skills**
- Maintain a well-organized lab book
- Plan the experiments in time and manner
- Follow the plan as much as possible

**Become competent at performing experiments**
Some days I don’t know what I am doing…….. I am frustrated!!!
You would appreciate the importance of perseverance
Will I ever have my own research ideas?

With time you would develop original research ideas.
You would become a critical thinker

- are curious
- reserve judging until they have all the facts
- formulate well-reasoned arguments
- are open to changing their opinions based on new information
- ask relevant and pertinent questions
- are aware of their own biases
What can you get from a Summer Research at FOMD?

- Learn how science really works
- Enrich your perspective on scientific medical research
- Find out that this is your way to change the world
- Become an advocate for science

Learn how science really works
Why is Important to Communicate Science to the Public?

Money from the taxpayer fund research

Misinformed members of the public bombard researchers with suffocating new regulations

Public trust in scientists seems to be decreasing and this is shaping policy makers attitudes towards the negative

The majority of policy makers and people in positions of power are not scientists
The general population has notably different views from those of the scientific community on key science-related issues.
Percentage of People Who Say that the Benefits of Scientific Research Outweigh the Harmful Results, by Educational Level:

- Less than High School: 52%
- High-School Diploma: 67%
- Some College: 72%
- Bachelor's Degree: 84%
- Graduate/Professional Degree: 94%


*From Perceptions of Science in America* (American Academy of Arts & Sciences, 2018)
An Opinion Gap Exists Between the General Public and Scientists on Science and Technology Topics

Opinion Differences Between Public and Scientists
% of U.S. adults and AAAS scientists saying each of the following

<table>
<thead>
<tr>
<th>Biomedical sciences</th>
<th>U.S. adults</th>
<th>AAAS scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe to eat genetically modified foods</td>
<td>37%</td>
<td>51 point gap 88%</td>
</tr>
<tr>
<td>Favor use of animals in research</td>
<td>47%</td>
<td>42%</td>
</tr>
<tr>
<td>Safe to eat foods grown with pesticides</td>
<td>28%</td>
<td>40%</td>
</tr>
<tr>
<td>Humans have evolved over time</td>
<td>65%</td>
<td>33%</td>
</tr>
<tr>
<td>Childhood vaccines such as MMR should be required</td>
<td>68%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Antibiotic resistance

Knowledge and understanding of antibiotic resistance

91% say they have heard of the term “antibiotic resistance”

56% say they have a good understanding of what the term means

What do people understand by the term “antibiotic resistance”?

- 31% say it’s the body becoming resistant to antibiotics
- 28% say it’s antibiotics being less effective
- 20% say it’s about overuse of antibiotics

https://blog.wellcome.ac.uk/2016/04/12/how-do-the-public-really-feel-about-science-and-research/
In an age of such rapid scientific and technological advancement we risk widening the gap between scientists and the public.

“Speaking up for the importance of science to society is our only hope…”

What can you get from a Summer Research at FOMD?

- Learn how science really works
- Enrich your perspective on scientific medical research
- Find out that this is your way to change the world
- Become an advocate for science
- Realize that scientific research is not for you
- Find out that this is your way to change the world
Whatever path you follow, you’ll have a learning experience that makes a true and lasting impact in your future.
Your Summer Research at FOMD

Think Boldly

Dream Big

Be Responsible
It is important to keep in mind that....

- Our work is supported by the public
- Our research impacts the public
- The public should be able to understand what drives us, and how they have supported us to develop our research
Number 1 Responsibility: HONESTY

ALERT! MISCONDUCT!!!