DISCUSSION QUESTIONS
FOR HIGH SCHOOL
TEACHERS AND THEIR
STUDENTS

October 2019

For all four articles:

The materials presented here represent authentic re-
search that is probably pretty specific (i.e. not directly
covered in your high school course work). What parts
of your curriculum (your course outline) are directly
related to the topics written about in each of the four
papers (or choose one)?

For each of the four topics presented (or choose one),
how would you build a model using recycled materials
to illustrate the key concepts of the topic?

These materials describe scientific discoveries that can
benefit human medicine. However, many discoveries
don’t necessarily start off with the intent of being used
in medicine. Research for the sake of curiosity and
general knowledge (i.e. not deliberately thinking about
applications) is often referred to as basic research.
Why do you think basic research is so important for
science and for society?

For “Plants: Amazing Phyto-Pharmacies”:

Phytochemicals are often the reason why many herbal
remedies work. But how is a medicine in the form of a
phytochemical different from that of an herbal remedy?

Do a little research on the term biopiracy. What do you
think of this issue?

For “Kinesin: The Little Engine that Could”:

The paper mentioned that a cell has a sort of “skeleton”
of its own, called a cytoskeleton. The paper also men-
tioned a few reasons why this is important - can you
highlight them? Can you think of other reasons why a
cytoskeleton might be important?

The fact that Dr. Vale discovered kinesin using nerve
cells from giant squids might sound strange, but in
biology, it’s not uncommon to make discoveries by
studying other organisms. Why do you think this is the
case? Look up the term model organism, and discuss
an example of a model organism.

For “DNA Replication: Not your Office Photocopier”:

What would happen to your cells if they were only able
to initiate replication at one site of each cell’s genome?
What would happen to you?

Cancer often requires the accumulation of multiple mu-
tations in the DNA (i.e. lots of things need to go wrong
for a cancer effect to be seen). As outlined in the paper,	only one of the first mutations involves one that makes
DNA replication itself more error prone. Why might
this lead to a cascading effect, and ultimately lead to
the cancer itself?

For “Integrins and the Social Network of Cells”:

If you’ve had an infection before, what are some of
the symptoms that you are familiar with? Do any of
these seem to relate directly to how integrins might be
involved?

The paper made mention of cancer. Look up the word
metastasis, and discuss in the context of how a defec-
tive integrin protein might contribute.

For more information about the Gairdner Foundation, please visit
https://gairdner.org/
For more information about the Canadian Society for Molecular
Biosciences, please visit https://csmb-scbm.ca/
For more information about the UBC Michael Smith Laboratories,
please visit https://www.msl.ubc.ca/