**Weekly Meeting Notes**

**October 20, 2023**

* Colon cancer exists in middle of pipe
  + Loaded with bacteria
* Some colon tissue & colon cancer tissue covered in bacteria
* Big question: Relationship between bacteria touching colon cancer & colon cancer itself?
* Looking carefully at cancerous tissue
  + To see if there is any bacteria
* Epithelial cells: Cells those lines tissue
  + For any organ that secrets things
    - Breast, prostate
  + Most cancers come from epithelial cells
  + Separates us from microbes inside of us
    - Special, thin barrier
      * Ability to absorb nutrients, excrete waste, keep out pathogens
* In colon cancer & in some normal tissue, some bacteria invade or get very close to epithelial cells
  + Biofilm
    - Sugary protein that is goo that helps bacteria adhere to surface
    - Help protect bacteria from antibiotics
    - Resistant to own immune system
    - More common in right side of colon
    - Ask question: Which came first? Bacteria nestle up next to epithelial cells to form cancer or cancer formed first and bacteria got attracted
* C. difficile was a part of these biofilms
  + Bacteria that has some properties
    - Forms spores released in stool, carried onto next host (ex: via surfaces)
    - Spores in healthy GI tract don’t do anything
      * In sick patients, will vegetate and produce toxins
        + TcdA, TcdB

Mediate disease, kill epithelial cells

* + Patients who have C. difficile infection
    - Cause is these toxins
    - Become susceptible while taking antibiotics for something else
      * Can go into gut and kill healthy bacteria
  + Wasn’t previously identified was related to causing colon cancer
    - Can accelerate colon cancer in genetically susceptible mice
* Question: How does C. difficile do that?
  + If toxin is what mediate disease in infectious diarrhea, is toxin what in a different patient lead to cancer?
    - Wanted to test that where can remove several variables
      * How big is person, diet, bathroom frequency
* Test it out in dishes
  + Matrigel
  + Expose them just to toxin, taking out many variables from C. difficile
    - Is it possible for C. difficile toxin itself to effect epithelial cells to induce cancer?
* 3728T
  + Identification of sample patient, T for tumor
* Consortium from 30 bacteria derived from original slurry from patient 3728 or mice who got slurry 3728
* At step where have raw sequencing data
  + Each of cDNA got sequenced in both directions
  + During reverse transcription single strand mRNA becomes into double strand DNA
  + Parameters built into it
* 2 separate files for samples
  + Samples numbered 1-30
  + Each have R1 and R2 file
    - Annotated by project ID, person’s initial’s, sample number, R1 & R2 for separate files (fastQ files, compressed with gzip)
* Storage & Memory
  + Memory
    - Align these 1 by 1, computationally intense, require way more memory
    - Use package: kallisto
* Next Step: Look through documentation of kallisto
  + Need to set up private GitHub
    - Find out how much data can be uploaded