**Monoclonal Antibodies**

* Immune system natural produces antibodies, but sometimes it would be helpful to have artificial antibodies—do this with the production of **monoclonal antibodies**
  + Issue: B-lymphocytes that divide do not produce antibodies, so how do we clone a single antibody on a massive scale?
  + Solution: **hybridoma method** fuses a B-lymphocyte with a cancer cell, enabling division of antibody secreting cells
    - Done usually by injecting an antigen in a mouse, then collecting spleen cells (B lymphocytes) that begin secreting antibodies against that antigen
    - Cells are combined with cancer cells, and ones that combine successfully and secrete the proper antibody are cultured.
* Monoclonal antibodies for diagnosis purposes
  + Diagnosing and locating blood clots: protein in blood clots is fibrin, B lymphocytes can produce and antifibrin antibody. Mouse spleen cells that generate that antibody are collected, fused with cancer cells to make antifibrin hybridoma cells, antibodies are labelled with a radioactive chemical.
    - Labelled antibodies injected in blood stream and will bind to fibrin they come in contact with. Gamma ray camera detects the blood clots once they’ve been tagged with antibodies.
  + Many applications for finding proteins in the body
* Monoclonal antibodies for treatment purposes: administered periodically to treat a condition
  + Gene tech has altered mouse antibodies (which would act as foreign antigens) to code for human amino acids in the antibody instead—**humanisation**
  + Antibodies can be used to tag other molecules/cells (like certain cancer cells) for destruction by the immune system.
* Monoclonal antibodies end in the suffix –mab

