Mabs Isolation and testing

Blood from convalescent

Cell sorting (FACS)

RT-PCR & Sequencing

manufacturing

In vitro

In vivo
A Brief History of mAbs Against Infectious Diseases

• (1900-1984) Several Nobel prizes leading to mAbs isolation and applications
• (1998) Palizuvimab (Synagis) against RSV
• (2012) Some mAbs stockpiled (anthrax)
• (2012-2014) Ebola mAbs (Zmab-Zmapp)
• (2014-2020) Regeneron-RD114 to Panfilo-MBP134
• (2020) Explosions of mAbs against COVID (4 approved)

• Main challenge = **HIGH COST**
• Main advantage = Easy to isolate better cheaper products.
Ebola outbreaks
To March 29th 2015
Number of people:
- infected
  - of whom:
- dead

Senegal
- 3,492

Guinea
- 2,314
- 11,974
- 3,799

Sierra Leone
- 9,712
- 4,332

Liberia
- 86

Nigeria
- 20

Mali
- 6

Congo
- 66,49
- 10,460

Number of people infected
Per 100,000 population

Sources: WHO; UN; The Economist
*Declared Ebola-free  †Excluding Congo
Correlates of protection with statistical significance = a driving force to develop mAbs against Ebola

Ebola mAbs (Zmapp) led to FDA approved Regeneron-RD114 (2020) to pan filo MBP134
• 1986: First mAb approved by FDA/EMA.
• 2014: 47 mAbs approved by FDA/EMA – 1 against ID in use.
• 2018: 409 Antibody Companies – Research & Development
• 2022: 127 mAbs approved – 20 pending
Economy of developing mAbs (CCHFV)

- About $100,000 higher in oncology
- Zmapp: $2M
- Pan-CCHF mAbs = $1M
- RSV/HMPV mAb = $0.120M
- Non-profit, non-governmental company
- Flood the market
- 2000$/g/dose market price Covid mAbs
- $24.75/g to $68.75/g for insulin
Top danger: incorrect statements from decisions makers

- “There is no human-to-human transmission” from China around mid-January 2020
- “The virus is not coming here in Europe” Feb 2020 meeting at WHO
- “Masks don’t work - they could make it worse” “don’t use masks”, “leave them to HCWs, only them know how to use them”).
- “N95 are not necessary, don’t add protection” on prohibiting HCWs from using N95.
- “Only vaccines can protect against COVID”, “If you got 2 shots you are protected 100%”
- “All approved vaccines are 100% safe and efficacious” (wow 100% huh!): Justin Trudeau.
- “Wash your hands - all the times” : there is yet to be 1 study that document transmission from fomites with community spread impact.
- “2 meters is enough - transmission is only contact and large droplets”
- “All adenovirus-based vaccines are 100% safe and efficient” (find them today)
- “Yearly vaccination against COVID will be required”
- “SARSCoV2 will evolve to be more pathogenic” : and this will be a first in the history of humankind
- “Coronaviruses don’t mutate much. They can’t”
1630/>2M pathogens causing disease in humans

- 753 Bacteria
- 307 Yeast, fungus
- 287 worms (helminths)
- 217 viruses (+prions)
- 66 Protozoan

FIOUFFFFF we are so lucky SARSCoV2 and MPX are not highly pathogenic viruses