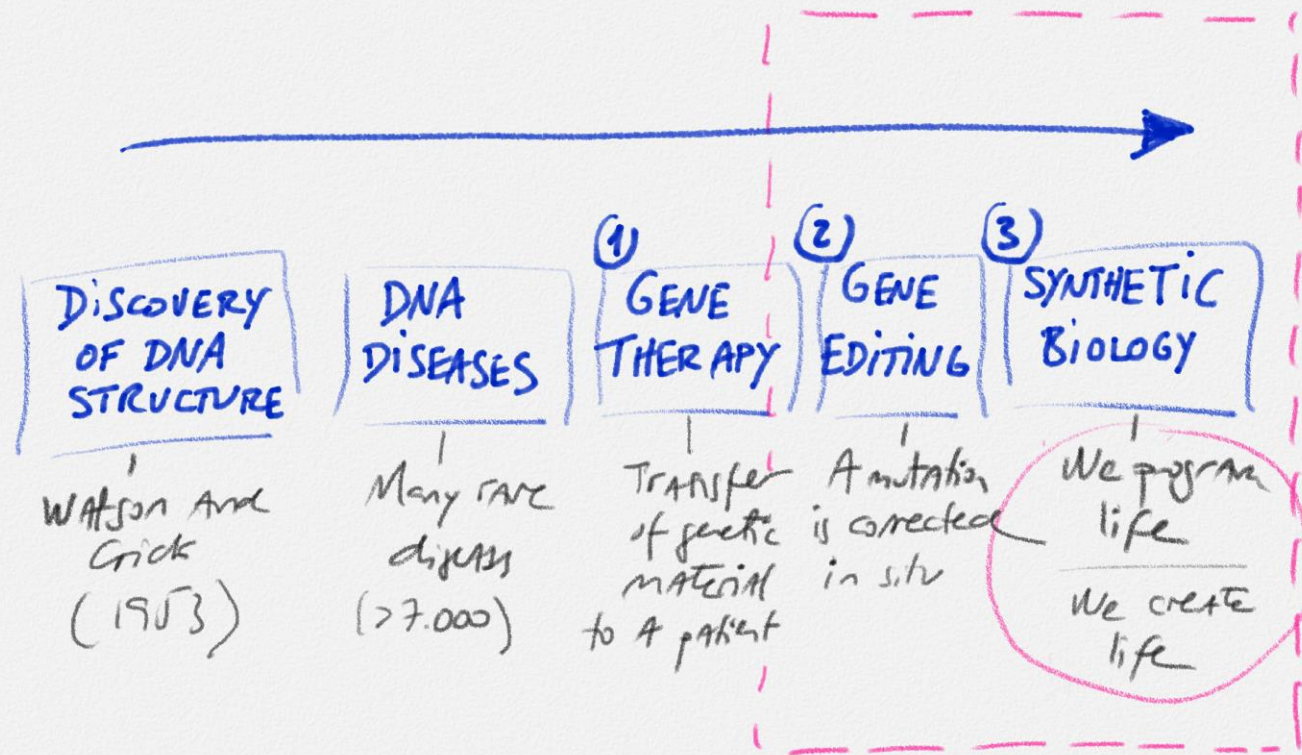


LIFE IS PROGRAMMABLE



SYNTHETIC BIOLOGY (A definition):

"THE DISCIPLINE OF ENGINEERING BIOLOGICAL FUNCTIONALITIES THAT WERE NOT EVOLVED BY NATURE"

reprogramming the old vs. programming the new
(recombining old code) (if, then... else)

SYNTHETIC BIOLOGY

CURE DISEASES WITH A PILL

Blurry line

CURE DISEASES WITH A CELL

OLD PARADIGM:

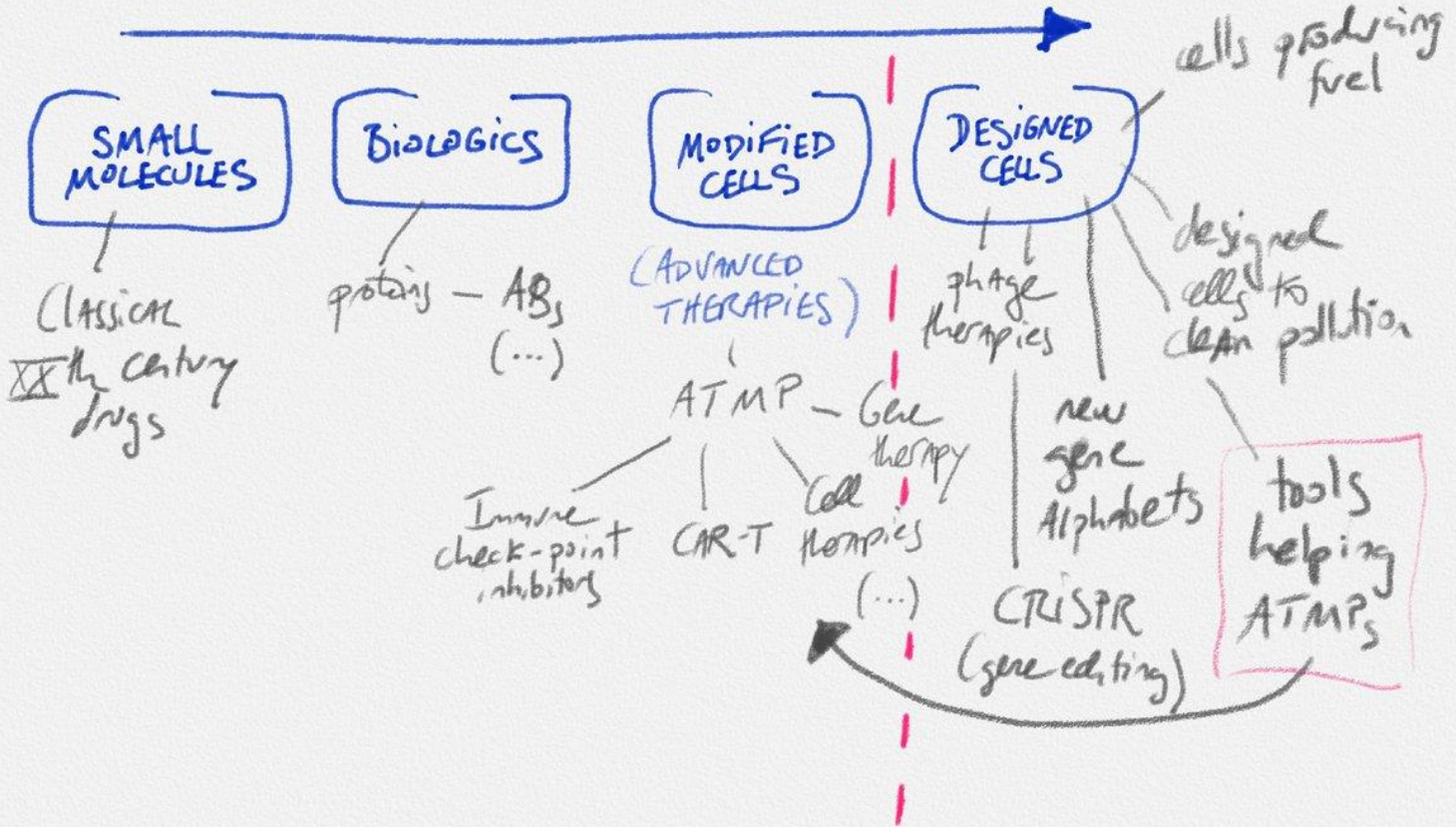
DISEASE
DRUG
KILL SOMETHING

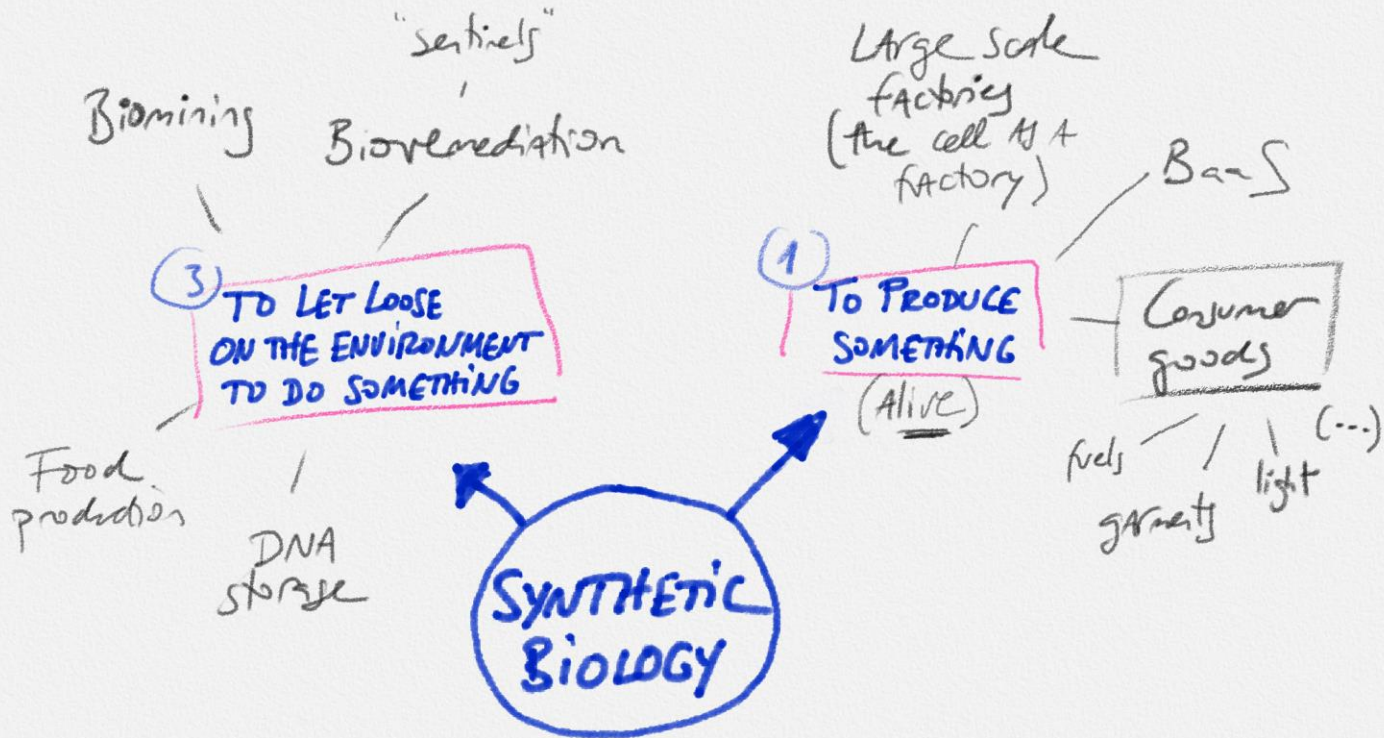


NEW PARADIGM:

DISEASE
DESIGN CELL
GROW SOMETHING

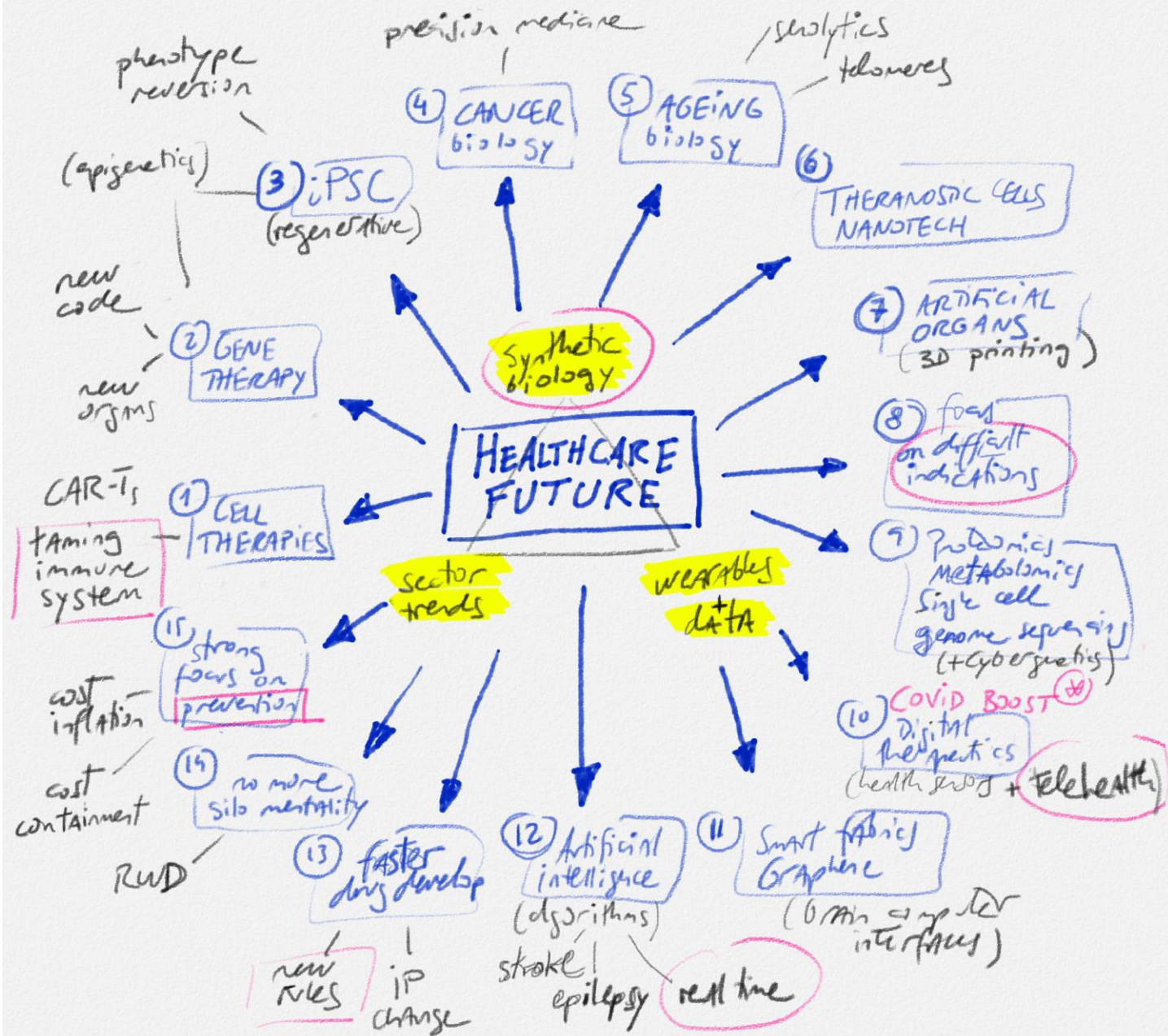
SYNTHETIC BIOLOGY





LIFE IS PROGRAMMABLE
LIFE IS THE PRODUCT





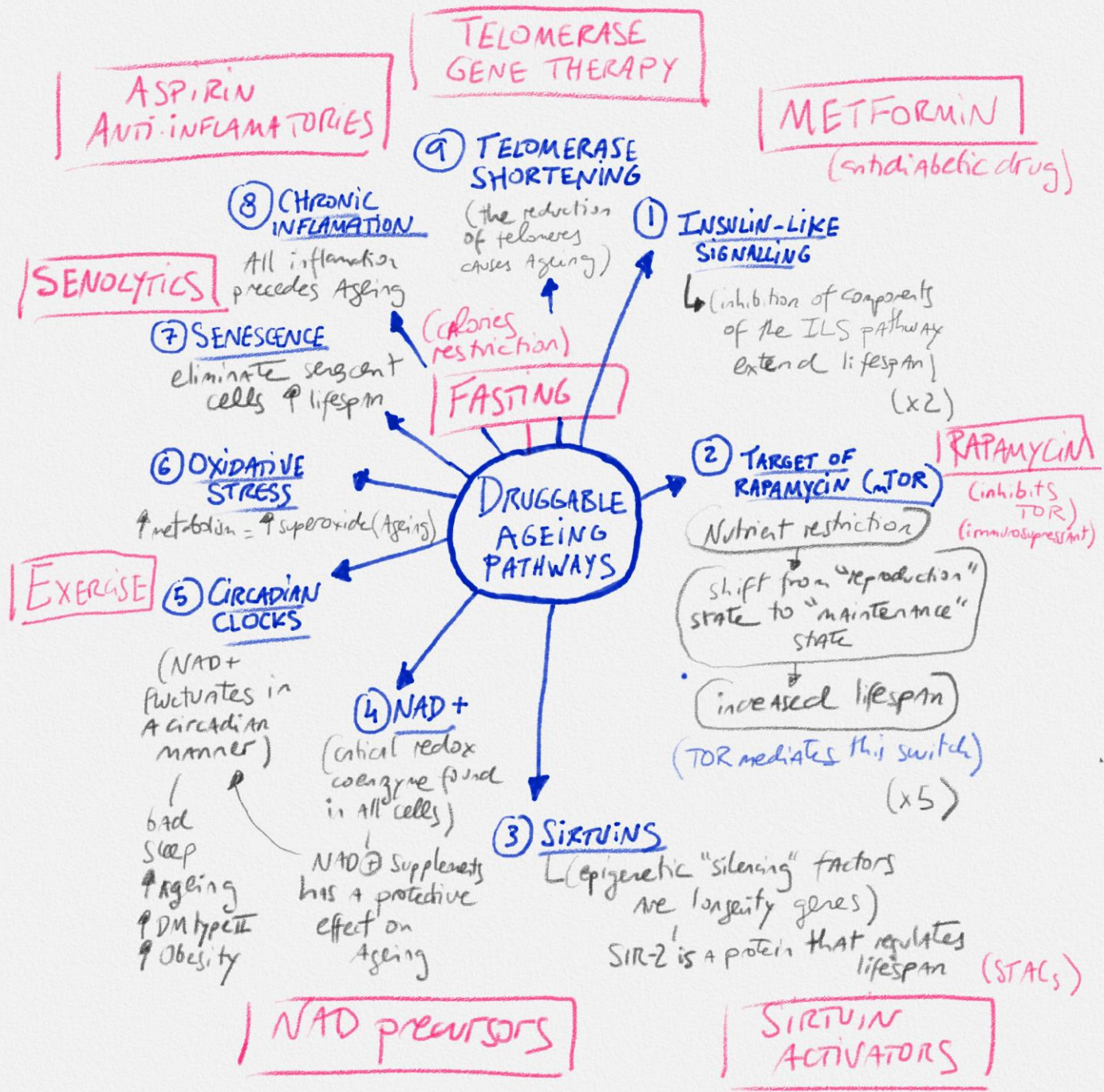
EXAMPLE



EXAMPLE



EXAMPLE



ASPIRIN
ANTI-INFLAMATORIES

TELOMERASE
GENE THERAPY

METFORMIN
(antidiabetic drug)

SENOLYTICS

FASTING

RAPAMYCIN

EXERCISE

NAD precursors

SIRTUIN
ACTIVATORS

TELOMERASE
GENE THERAPY

① TELOMERASE
SHORTENING
(the reduction
of telomeres
causes Ageing)

① INSULIN-LIKE
SIGNALLING
(inhibition of components
of the ILS pathway
extend lifespan)
(x2)

② TARGET OF
RAPAMYCIN (mTOR)
Nutrient restriction
shift from "reproduction"
state to "maintenance"
state
increased lifespan
(TOR mediates this switch)
(x5)

③ SIRTUINS
(epigenetic "silencing" factors
are longevity genes)
SIRT-1 is a protein that regulates
lifespan (STACs)

④ NAD+
(critical redox
coenzyme found
in all cells)
NAD+ supplements
has a protective
effect on
Ageing

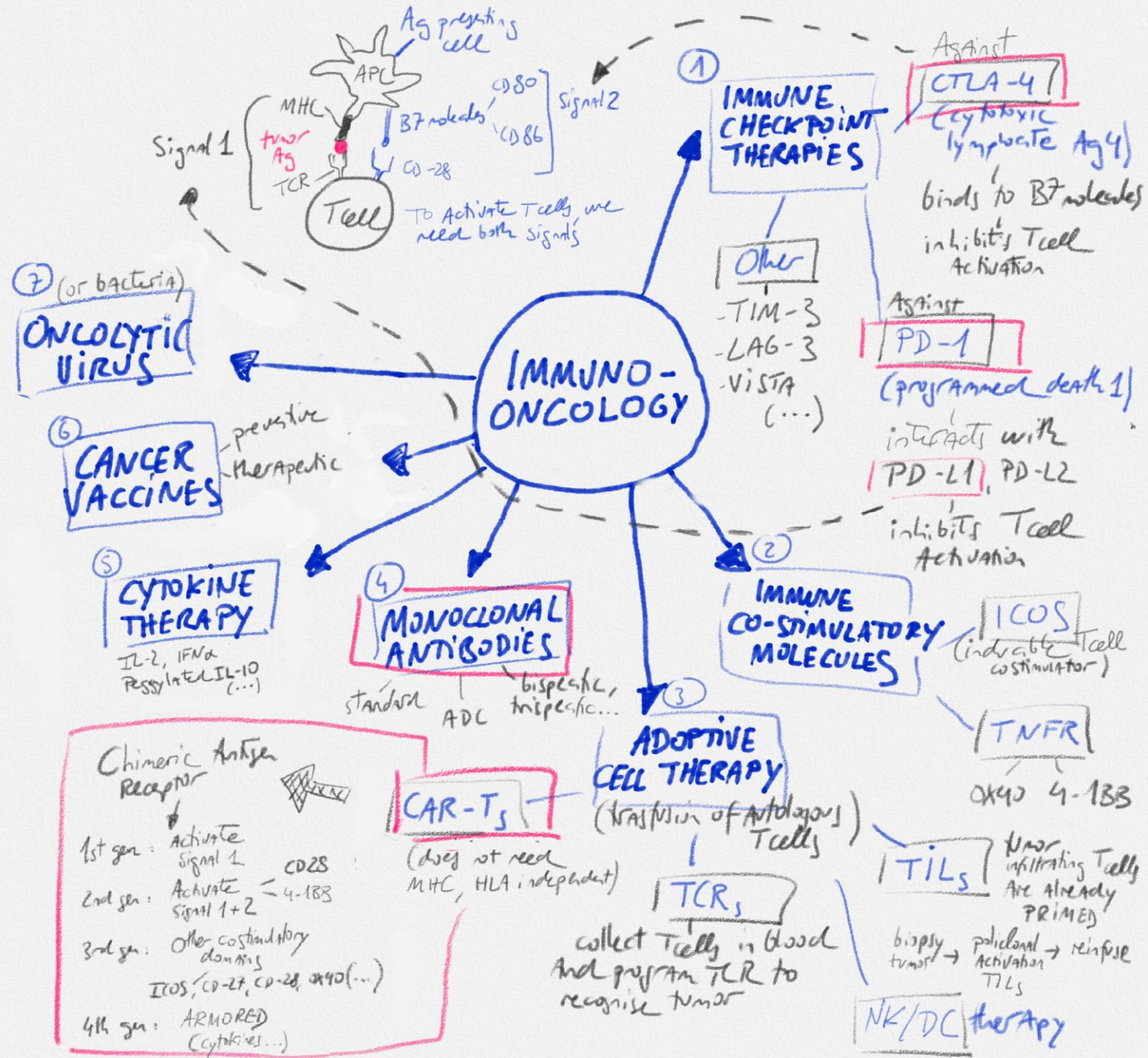
⑤ CIRCADIAN
CLOCKS
(NAD+
fluctuates in
a circadian
manner)
bad
sleep
↑ Ageing
↑ DM type II
↑ Obesity

⑥ OXIDATIVE
STRESS
↑ metabolism = ↑ superoxide (Ageing)

⑦ SENESCENCE
eliminate senescent
cells & lifespan
Colonies restriction

⑧ CHRONIC
INFLAMMATION
All inflammation
precedes Ageing

EXAMPLE



LIFE SCIENCES VCS : COVID-19 IMPACT

