



Healthcare vision 2040

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5 trends will transform healthcare between now and 2040

- Personalised medicine
- Stem-cell
- Nano-scale medicine;
- Gene therapy
- Digital health

Realization of sustainable care systems to overcome major diseases by 2040, for enjoying one's life with relief and release from health concerns until 100 years old

Targets of Moonshot Goal 7

(<https://www.amed.go.jp/content/000112669.pdf>)

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- ❑ Realization of a society where everyone can prevent diseases spontaneously in daily life
- ❑ Realization of medical networks accessible for anyone from anywhere in the world
- ❑ Realization of drastic improvement of QoL without feeling load (realization of an inclusive society without health disparity)

No more physical injuries and disabilities - no later than the mid-2040s.

Man as machine

❑ Smart implants

❑ Brain-Computer Interface (BCI)

- ❑ By the early 2030s, BCI will become advanced enough to allow people with spinal injuries to walk again by relaying their walking thought commands to their lower torso through a [spinal implant](#).

❑ Nanotechnology swimming through your blood

❑ 3D bioprinting

❑ Gene therapy

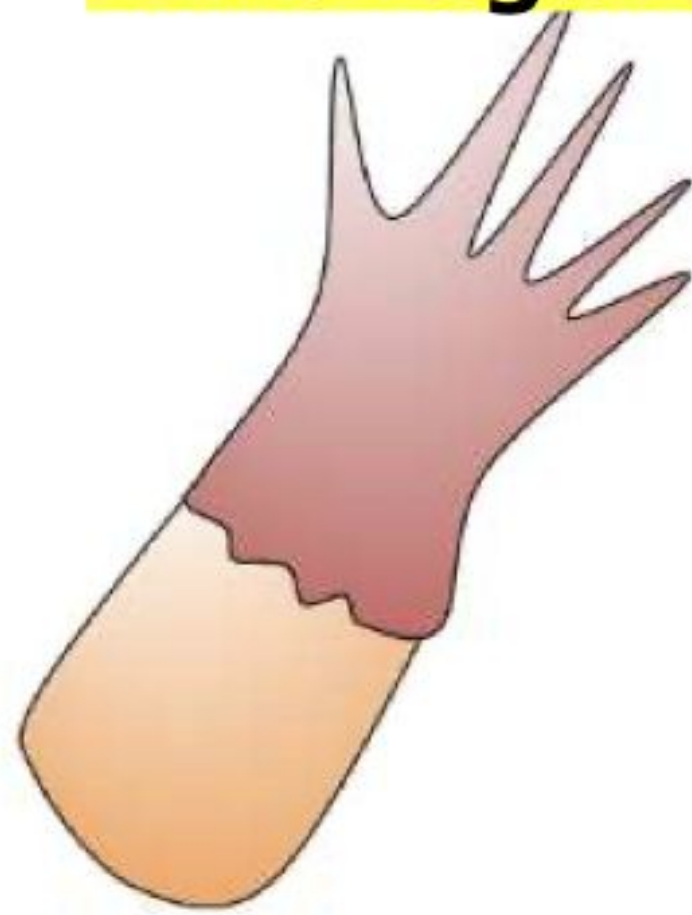
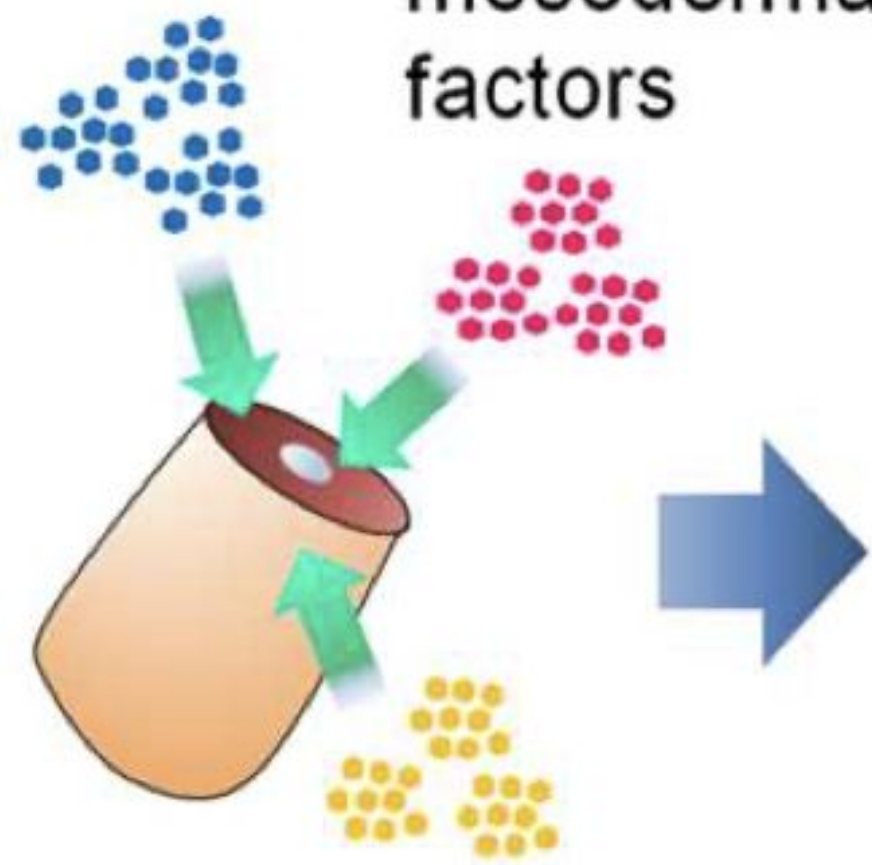
❑ Genetic engineering



Embryonic
ectodermal
factors

Embryonic
mesodermal
factors

Limb regeneration



Embryonic niche factors

BLOOD

- ❑ **Synthetic blood** -this blood will be mass produced in a lab, compatible with all blood types, and (some versions) can be stored at room temperature for up to two years
- ❑ **Medical gel** – instantly stop traumatic bleeding, kind of like safely supergluing a wound shut

THE HEART IS JUST A PUMP

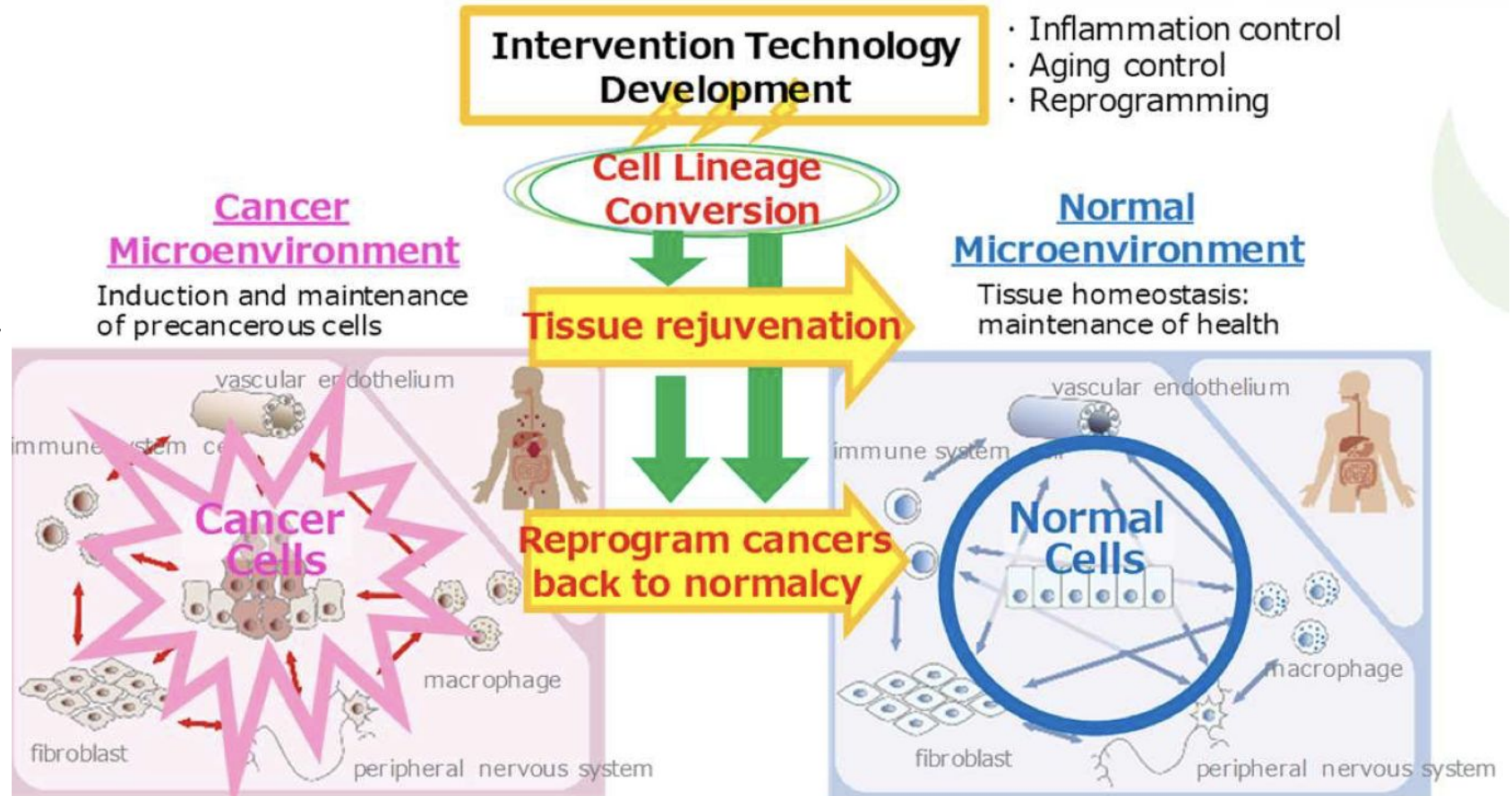


EXERCISE

- ❑ It's widely known that improved cardiovascular performance through exercise has a direct, positive impact on one's overall health.
- ❑ [exercise in a pill](#). -Far more than your average weight loss pill, these drugs stimulate the enzymes charged with regulating metabolism and endurance, encouraging a rapid burning of stored fat and overall cardiovascular conditioning.

CANCER

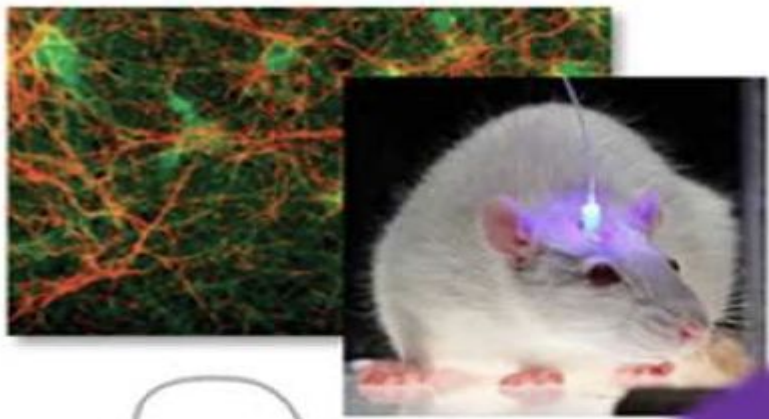
- Gene therapies
- Nanorobots
- Cancer vaccines
- Immunotherapy



UNDERSTANDING THE BRAIN TO ERASE MENTAL ILLNESS

100 billion neurons. 100 trillion synapses. 400 miles of blood vessels. Our brains frustrate science with their complexity. In fact, they remain 30 times more powerful than our fastest supercomputer.

- ❑ caused predominantly by genetic defects
 - ❑ mass market genetic testing/sequencing,
 - ❑ customized gene therapy procedures
- ❑ caused by physical injuries
 - ❑ Neuroprosthetics
 - ❑ Deep brain stimulation
- ❑ caused by emotional trauma
 - ❑ Complex therapies
 - ❑ The plague of troublesome memories
 - ❑ Restoring memories to heal the mind
 - ❑ Erasing memories to heal the mind



Increase the time for living



Prevent diseases due to sleep deficit

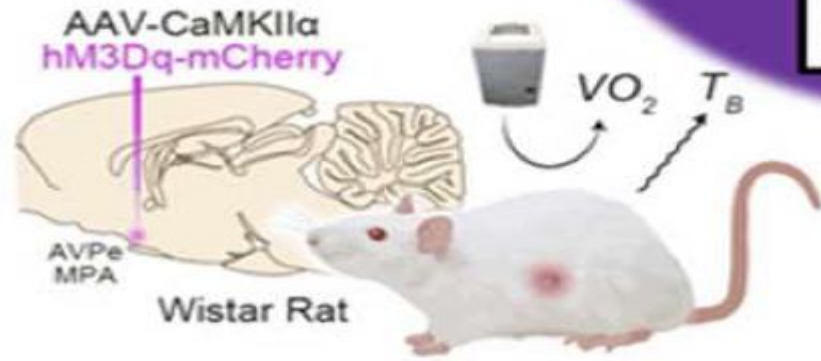
Understand and control sleep and hibernation

冬眠
睡眠



Innovation in emergency care

Enable interplanetary exploration



<Main

DECENTRALIZED HEALTHCARE

- ❑ Empowering individuals with tools to track their own health data;
- ❑ Enabling family doctors to practice health maintenance instead of healing the already sick;
- ❑ Facilitating health consultations, free of geographic constraints;
- ❑ Dragging the cost and time of comprehensive diagnosis down to pennies and minutes; and
- ❑ Providing customized treatment to the ill or injured to promptly return them to health with minimal long-term complications.

DECENTRALIZED HEALTHCARE- HOW?

- ❑ Constant and predictive diagnosis
 - ❑ Based on your unique DNA (At birth) - “healthcare roadmap” for your next 20-50 years, detailing the exact custom vaccines, gene therapies and surgeries you’ll need to take at specific times of your life to avoid serious health complications later on
 - ❑ personal health app, online health monitoring subscription service, or local healthcare network, to notify you about an impending illness before you even feel any symptoms.
- ❑ The omnipresent doctor
 - ❑ walk-in clinics empowered by medical AI, the doctor would step in to review the patient if needed
 - ❑ Remote consultations
- ❑ Emergency care speeds up
 - ❑ ambulances will be [converted to quadcopters](#) by 2040
 - ❑ [medical gel](#) that can instantly stop traumatic bleeding
 - ❑ [synthetic blood](#)

DECENTRALIZED HEALTHCARE- HOW?

Hospitals

- ❑ Using [chemical printers](#), hospitals will also be able to produce custom-designed prescription pills,
- ❑ 3D bioprinters will produce fully functioning organs and body parts using stems cells produced in the neighbouring department.
- ❑ Robotic surgeons
- ❑ Nanobot surgeons

Prof. Hiroshi Ishiguro

- <https://www.youtube.com/watch?v=uD1CdjlRtBM>





Human-like robots - Grace

Hanson Robotics



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