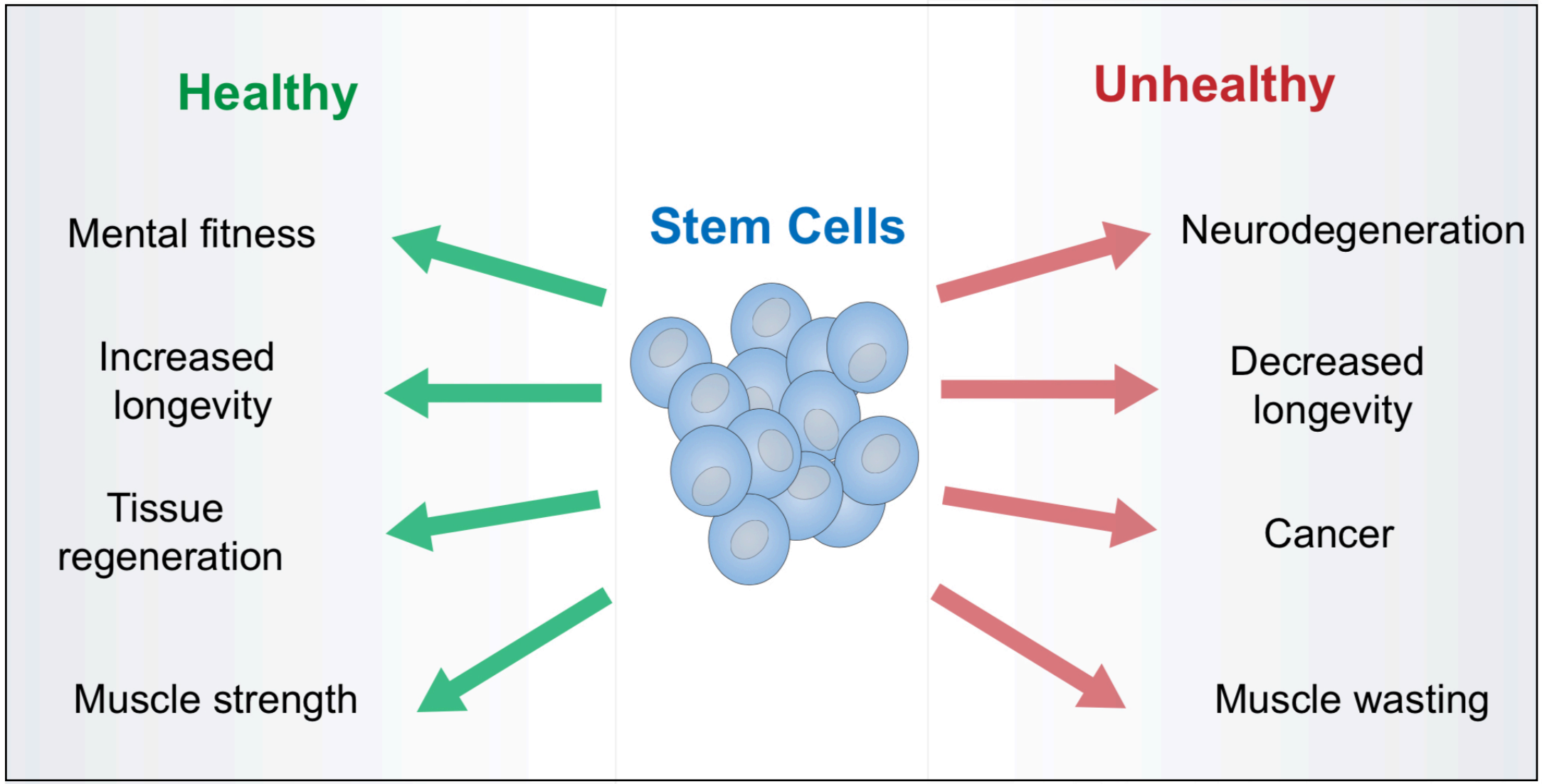
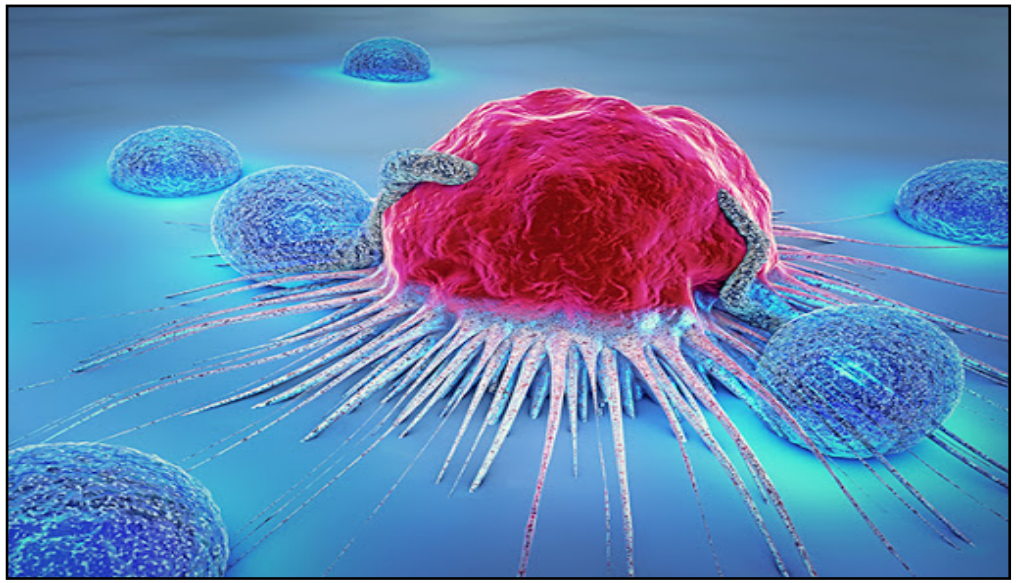
Manipulating stem cells to create a healthier future

Stem Cells: Two sides of the same coin



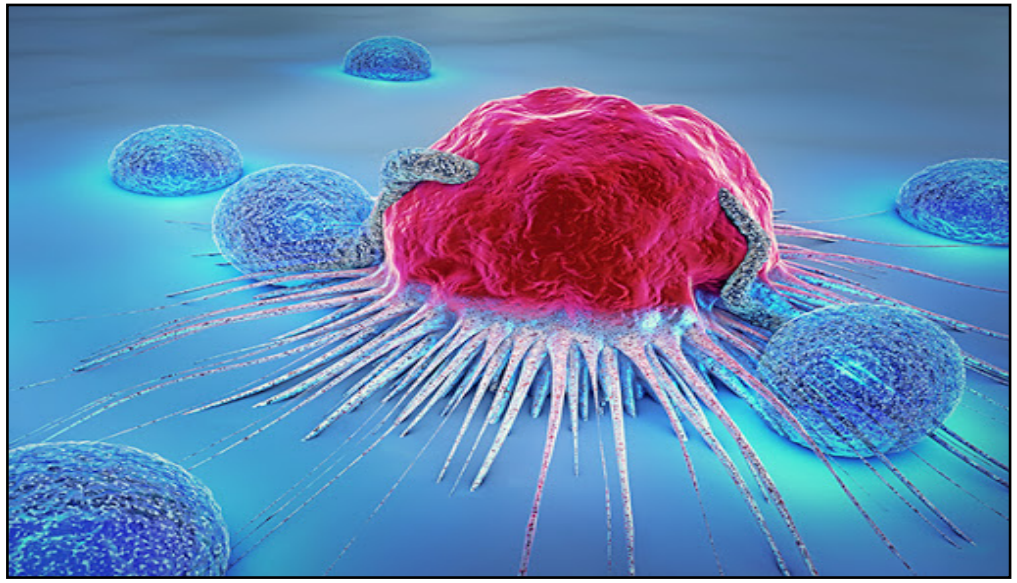
At oncoLife we believe that manipulating stem cell biology can benefit both sides of the coin:

‘onco’ – cancer



‘life’ – healthy aging

(1) Cancer



Cancer occurs when stem cells go rogue

Cancer cells are, in essence, just another group of stem cells in our bodies.

We need to be able to distinguish between cancer and normal stem cells in order to treat cancer effectively while sparing normal cells.

This has not yet been done effectively resulting in chemotherapies that are all harmful to patients.

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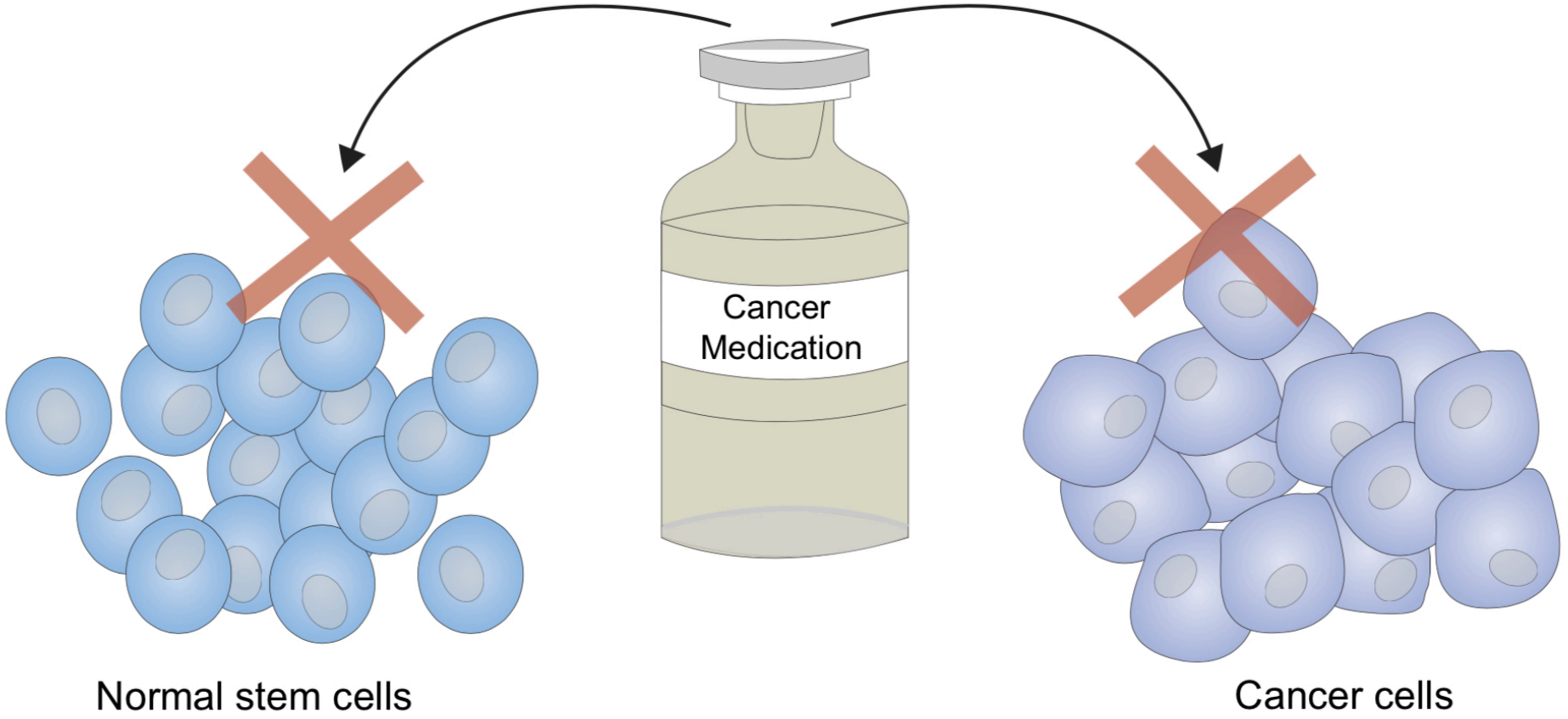
The Problem in cancer

Current cancer drugs target cancer cells but also harm normal stem cells



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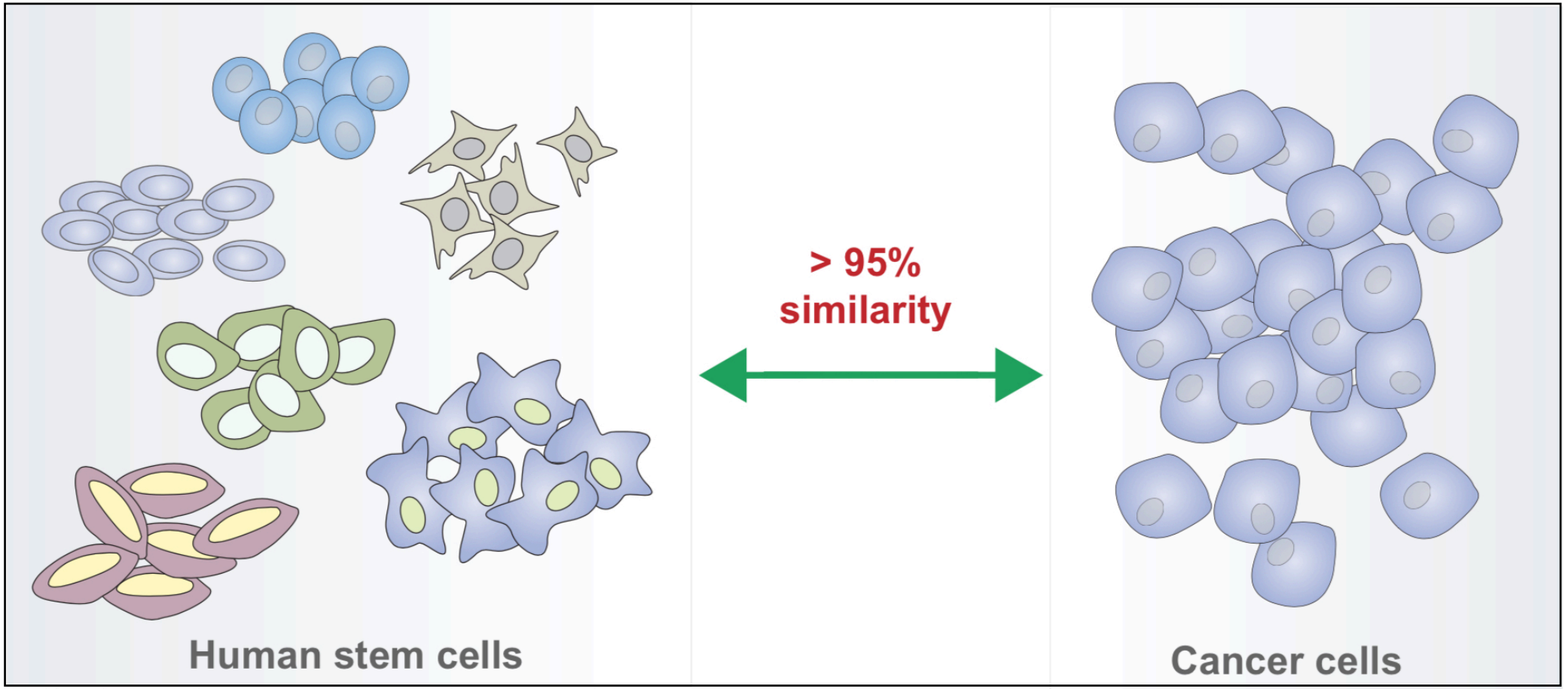
The Reason

Cancer stem cells are genetically >95% similar to normal stem cells



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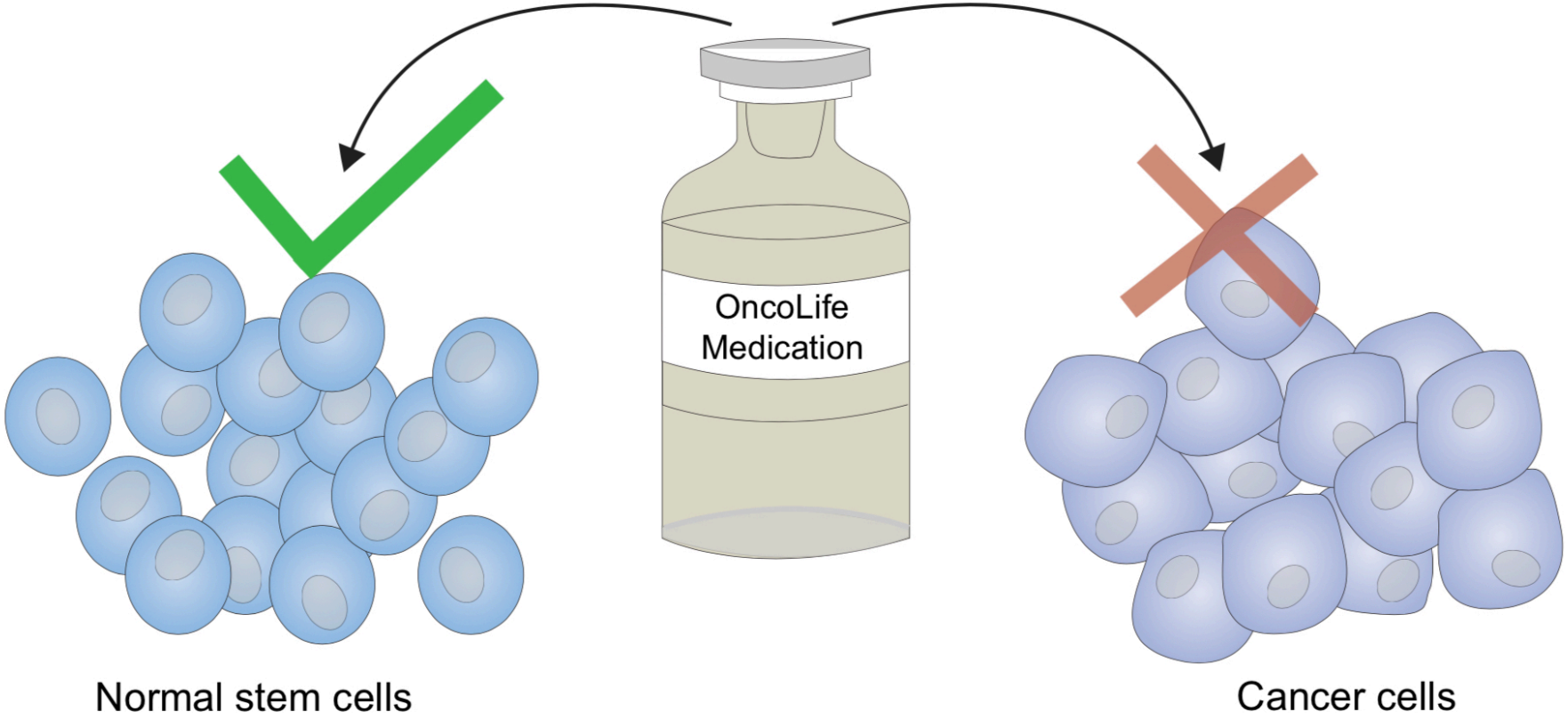
The Solution

Our cancer drugs target the uniqueness in cancer cells thereby leaving normal stem cells unharmed



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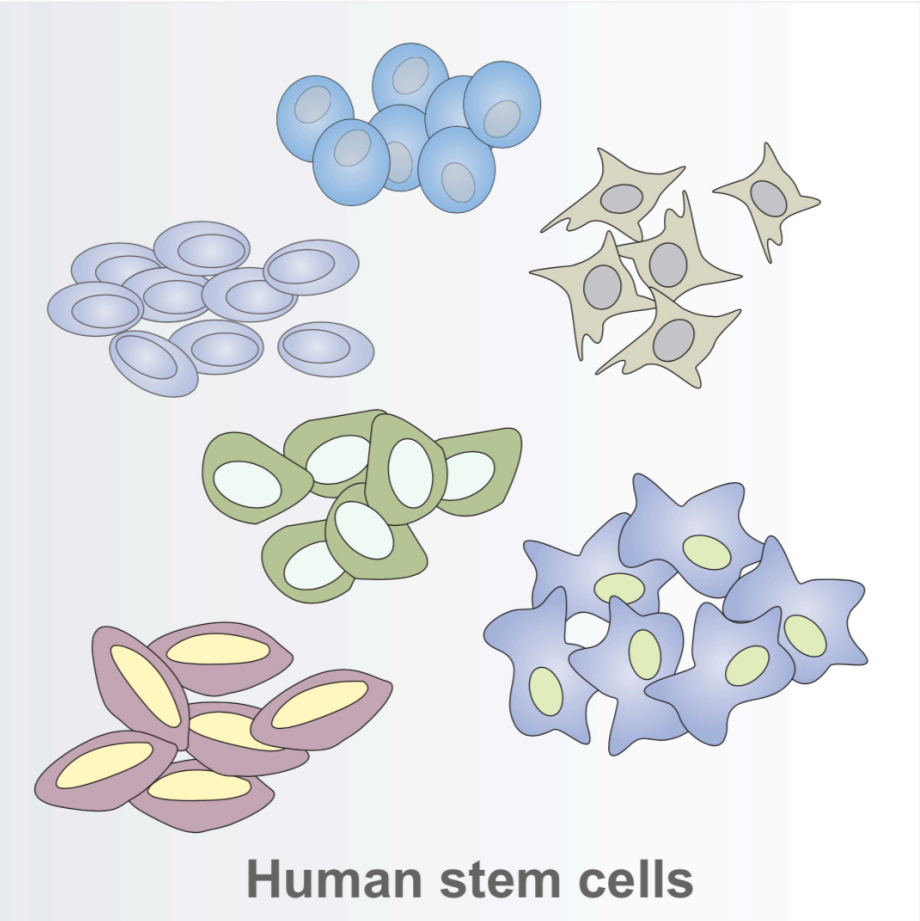
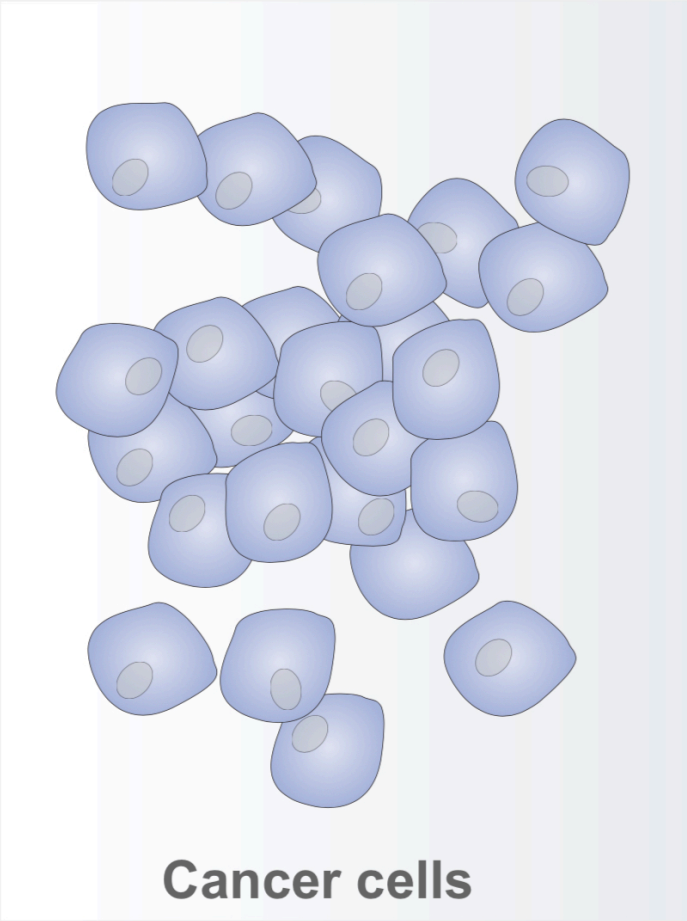
The Platform

We have generated a unique database of human stem cell data and compare against cancer cells



VS.



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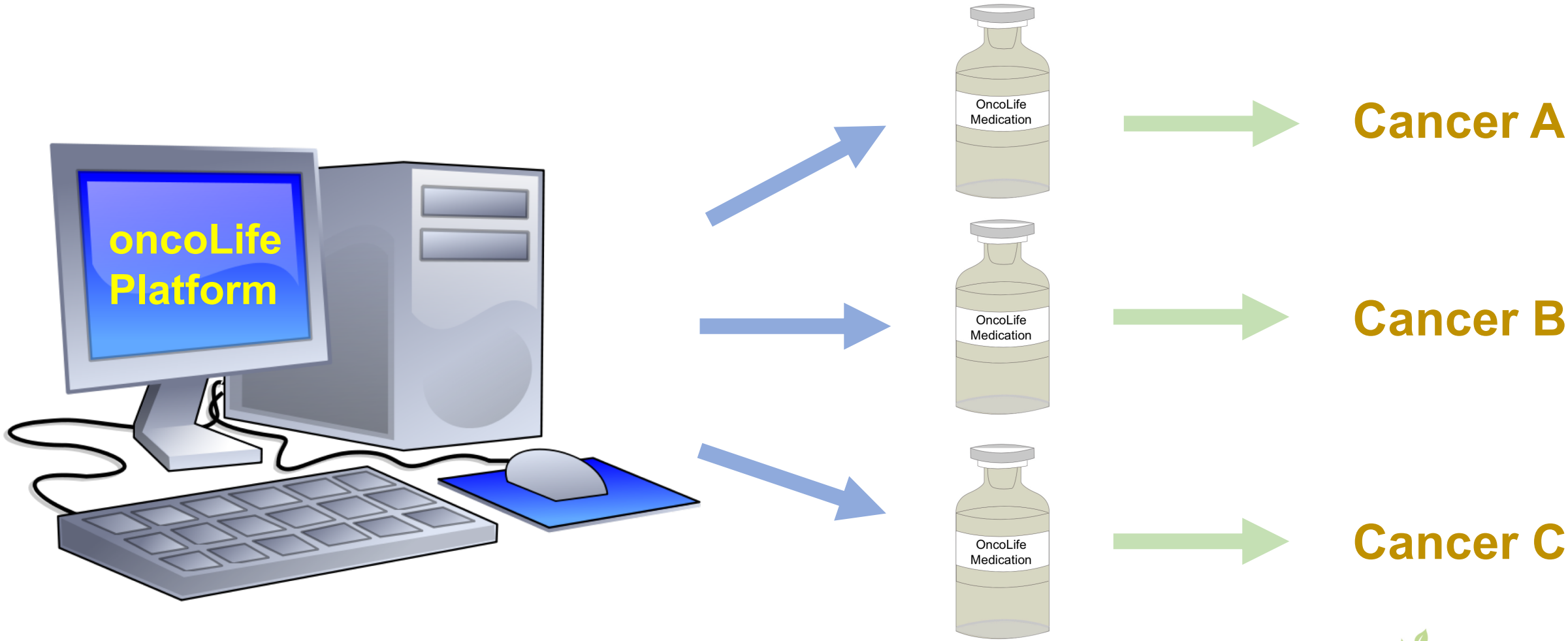
Our approach is novel

Our platform is able to identify specific targets for all types of cancers



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Our progress

INDICATION	In silico (Target identification)	In vitro (Target validation)	In vivo (Target validation)
Hepatocellular carcinoma	→	→	
Glioblastoma	→	→	
Multiple myeloma	→	→	
Head and Neck cancer	→		
Lung squamous cell carcinoma	→		
Lung adenocarcinoma	→		
Breast cancer	→		

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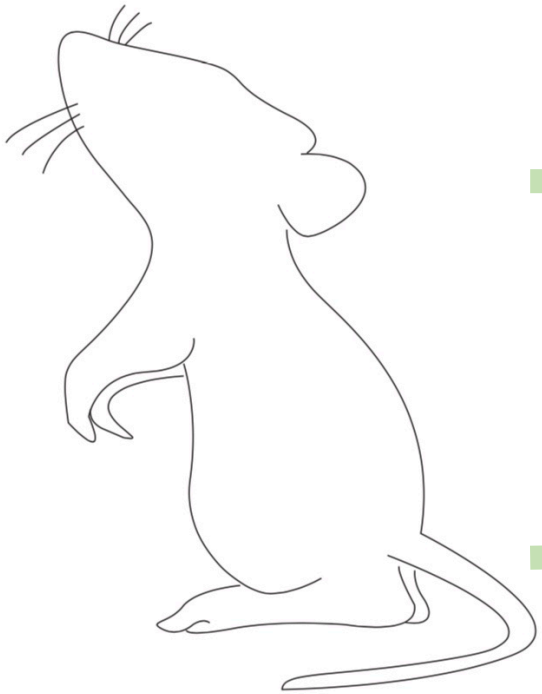
Next step: Pre-clinical animal models

Liver cancer candidates

Multiple myeloma candidates



Preclinically-validated targets for patent and clinical trials

Preclinically-validated targets for patent and clinical trials

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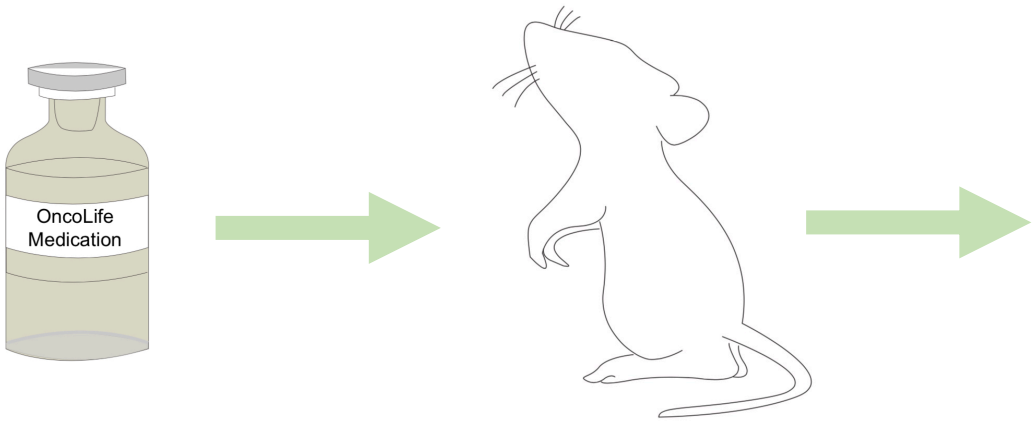
Liver Cancer Model (Hepatocellular carcinoma)

Liver cancer targets

- oncoLife Therapeutics (OTX)
- Antisense oligonucleotide (ASO)

- OTX1ASO
- OTX1GalNAcASO
- OTX2GalNAcASO
- OTX3GalNAcASO
- ScrambledASO
- ScrGalNAcASO
- Sorafenib



Altogen Labs will perform these studies and is a biology CRO company providing GLP preclinical research services and toxicology studies for Series A funding

Altogen Labs; Austin, Texas

6-month-old HCC-bearing animals (HepG2) will be treated with either an unconjugated (25 mg/kg) or GalNAc-conjugated (7.5 mg/kg) antisense oligonucleotides (ASOs) along with a scrambled control ASO (25 mg/kg) (n = 16/group) subcutaneously twice a week for 45 days.

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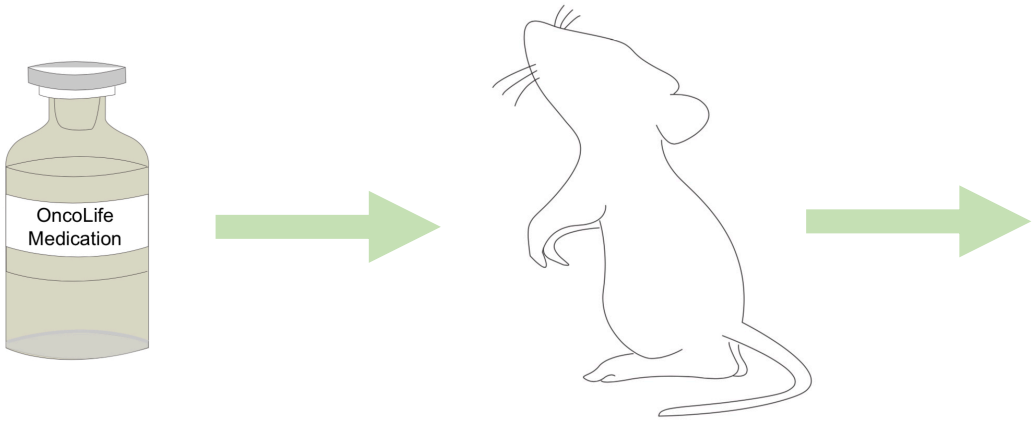
Multiple myeloma Model

Multiple myeloma targets

- oncoLife Therapeutics (OTX)
- Antisense oligonucleotide (ASO)

- OTX4ASO
- OTX5ASO
- OTX6ASO
- OTX7ASO
- OTX8ASO
- ScrambledASO
- Revlimid (Lenalidomide)



Co-Founder and CSO, A/Prof Paul Baldock will perform in vivo studies for necessary preclinical research and toxicology studies for Series A funding

Garvan Institute; Sydney, Australia

6-month-old MM-bearing animals will be treated with antisense oligonucleotides (ASOs; 25 mg/kg) along with a scrambled control ASO (25 mg/kg; n = 10/group) intravenously twice a week for 4 weeks and compared with the most widely used current treatment (Revlimid).

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(2) Aging

Stem cells are at the core of ageing

We at oncoLife are exploring underlying mechanisms, mostly directly related to stem cell function, to understand the mechanism of ageing.

Age-related stem cell dysfunction is especially attractive as a causal factor, and our conceptual approaches to mitigating age-related conditions include:

(1) Restoring telomere length in stem cells

(2) Reversing age-related epigenetic changes in stem cells

(3) Identifying factors in young blood that confer youthfulness

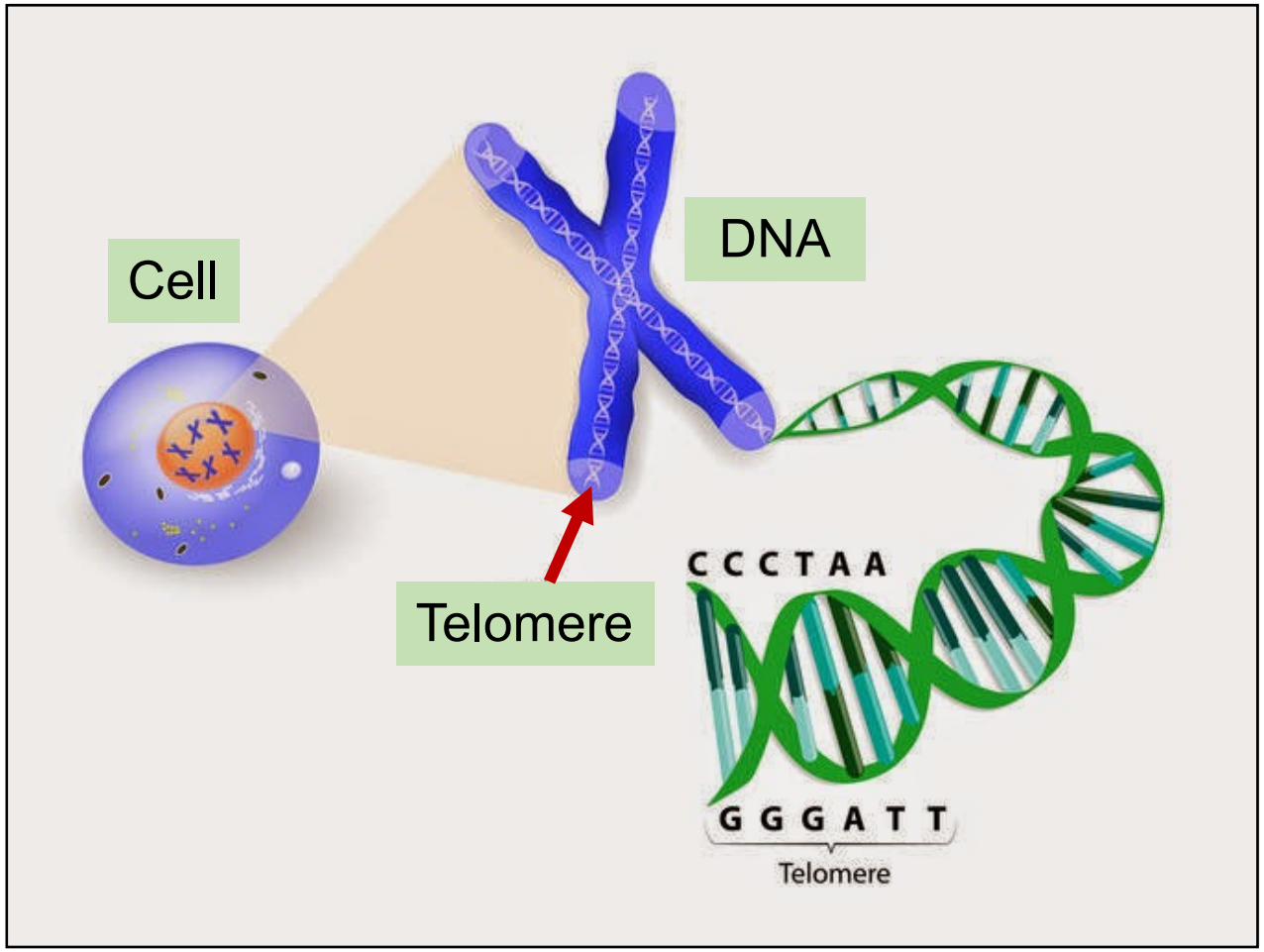
(4) Mimicking the glycaemic benefits of exercise and fasting through an endogenous peptide.

Stem Cells: How do we age?

In every cell, the tips of our DNA are protected by ‘caps’ called telomeres.

During aging, telomeres shorten. Therefore, old stem cells, that do not work as well any more, have shorter telomeres.

Telomeres in stem cells hold the key to aging-related problems, including reduced muscle function, a weaker heart and neurodegeneration.



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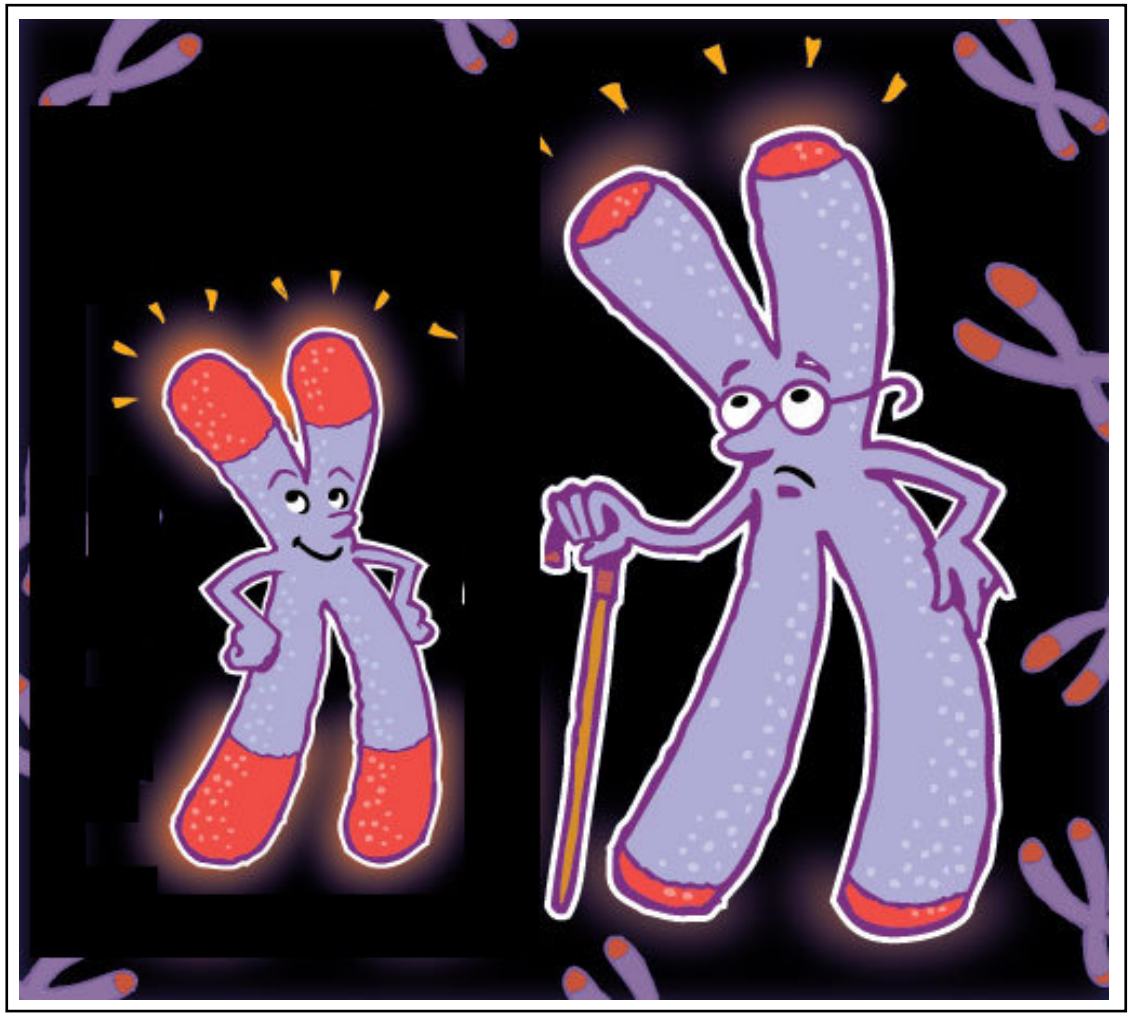
Can we promote healthy aging in stem cells?

We at oncoLife believe that we can promote telomere lengthening and restore appropriate stem cell function using a range of diet, exercise and unique therapeutic interventions to reverse cellular aging and restore health and vitality.



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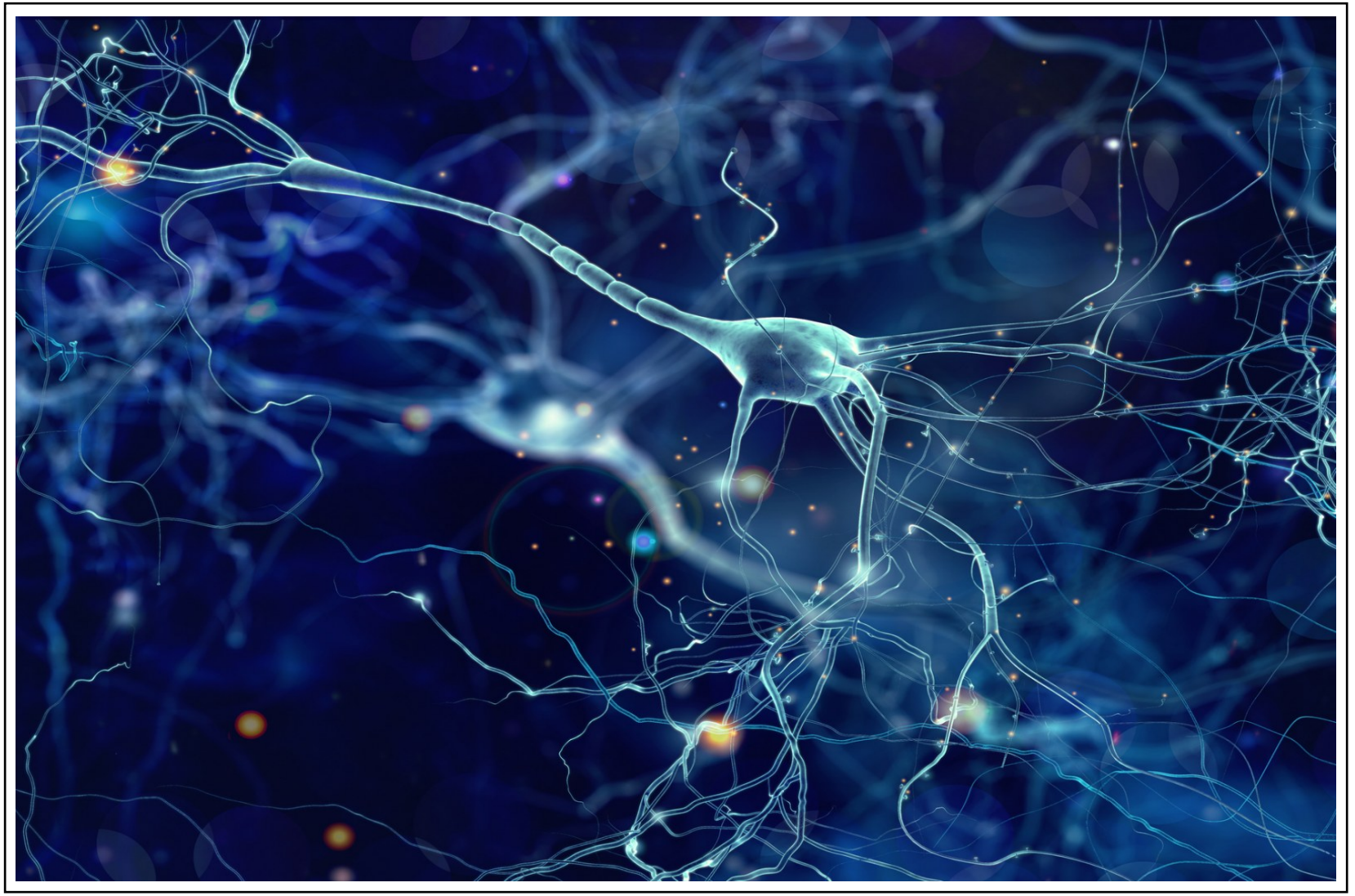
Our recent aging study investigated human stem cells in the brain from infants to centurions.



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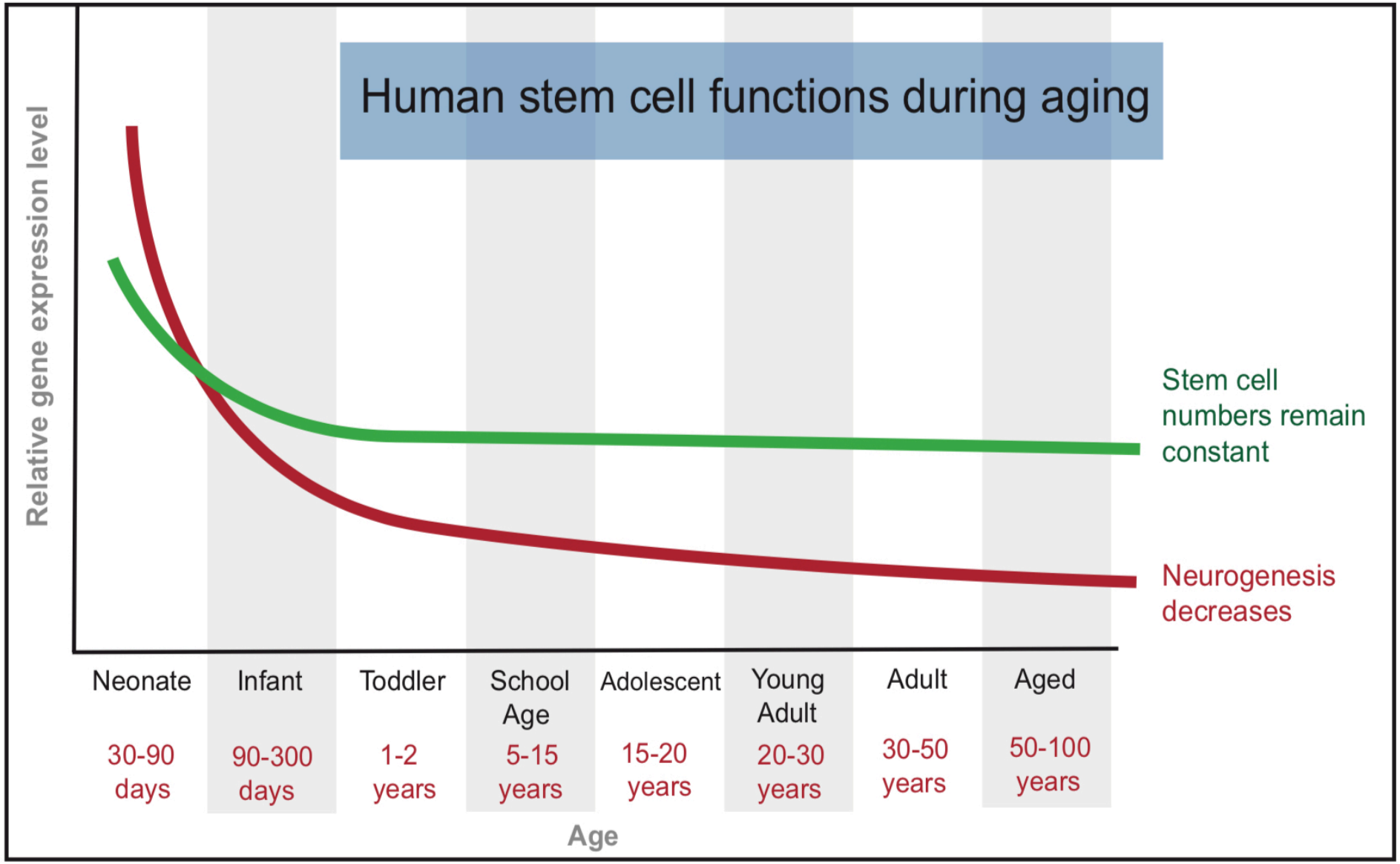
Brain stem cells remain intact throughout aging but neurogenesis decreases



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Our studies shows that, contrary to popular belief, stem cell numbers remain steady throughout aging but it is their activation when needed that is compromised.

We believe that there is a connection between telomeres and stem cell activation. As telomeres shorten, the ability of the stem cell to be activated is decreased.

This concept provides answers to how we age and provides opportunities for therapeutic intervention that we will pursue at oncoLife.

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Mimicking the glycaemic benefits of exercise and fasting through an endogenous peptide.

We have extensive *in vitro* and *in vivo* data to show that this endogenous peptide functions as an insulin-sensitizer, similar to the actions of metformin but even more potent.

This will be a blockbuster drug, able to be used in the diabetes and anti-ageing spaces.

We are happy to share this data under a CDA.

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oncoLife Therapeutics: Company structure

- Registered: March 2020
- Website (https://www.oncolifetx.com)
- Founder, Director and CEO - Dr Guy Barry

  Founder, Director and CSO - A/Prof Paul Baldock
- Bioinformatics (*In silico* and *in vitro* testing facility: Translational Research Institute (TRI; Brisbane, Australia)
- Intellectual property for the bioinformatic platform is held by Dr Guy Barry

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