Anti-Cancer & Anti-HIV effects of ALKA V-6

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OBJECTIVES

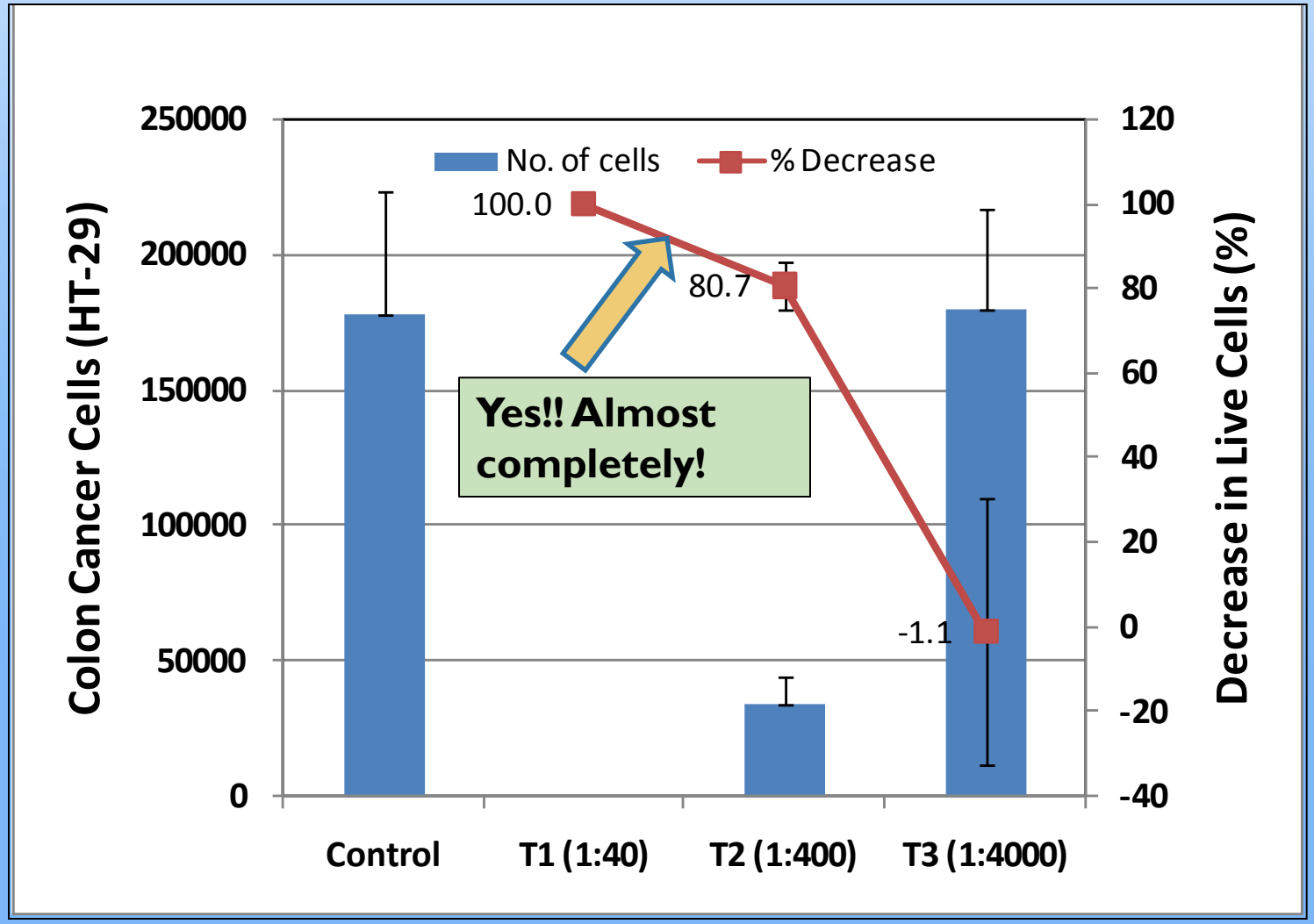
- The overall objective of this research was to determine
  - Cancer chemotherapeutic
  - Anti-retroviral effects

  of ALKA-HYDROXY in cell cultures and other in vitro systems.

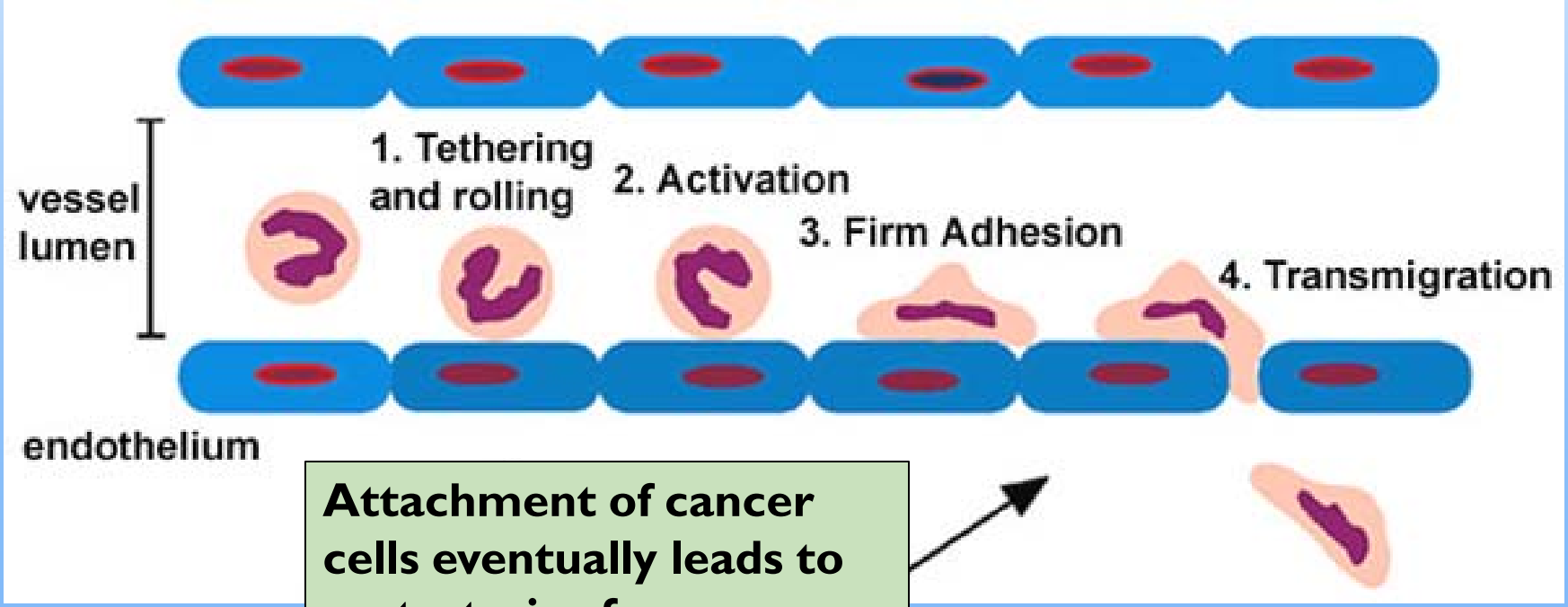
Anti-Cancer Effect

- What is the ability of ALKA V-6 to prevent mutations in the DNA?
- What is the ability of ALKA V-6 to prevent oxidative stress?
- Induce programmed cell death
- Activate antioxidant enzymes
- Increase Nitric oxide

Can ALKA V-6 kill Cancer cells??



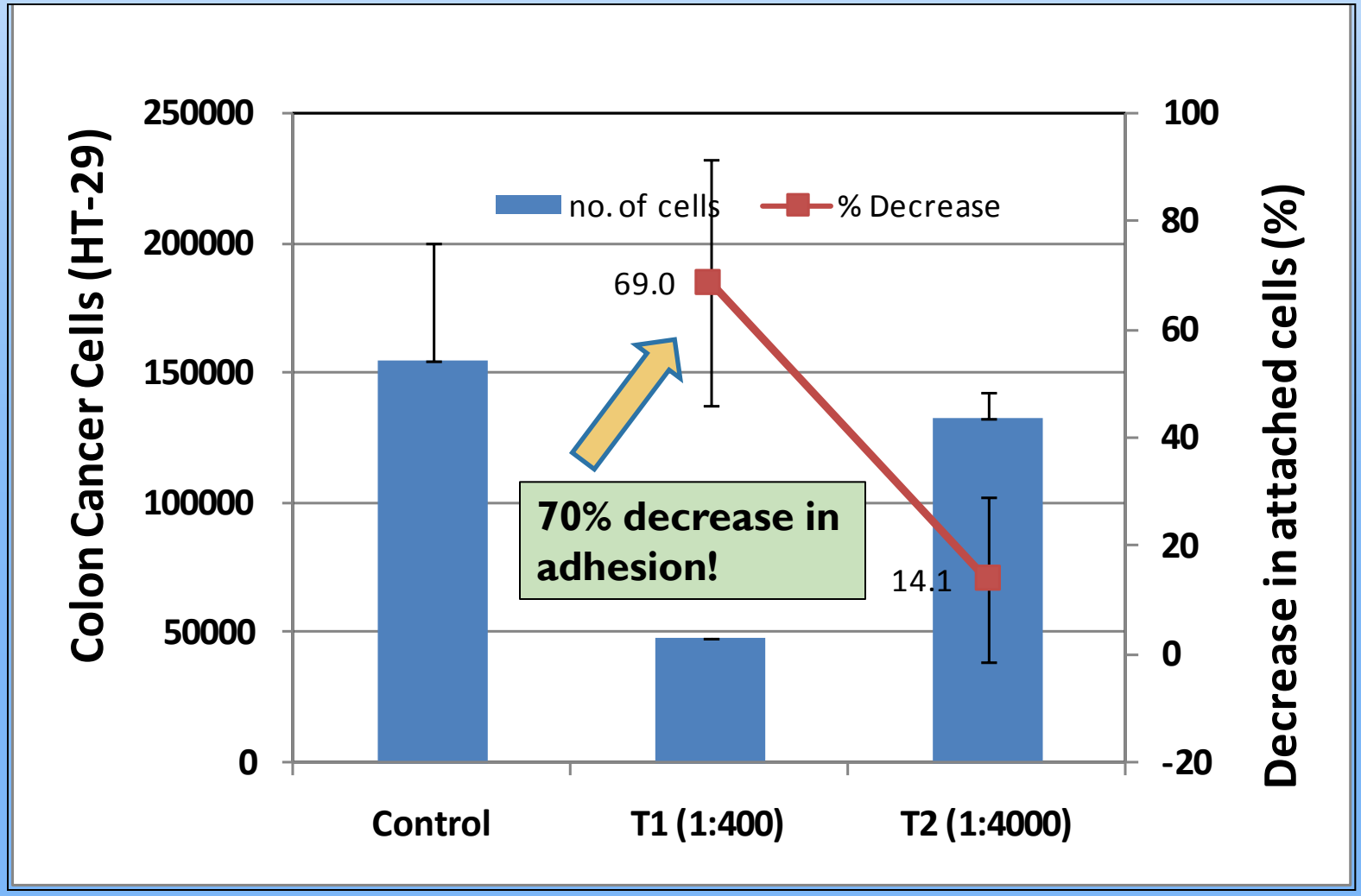
Adhesion of Cancer Cells



Attachment of cancer cells eventually leads to metastasis of cancer.

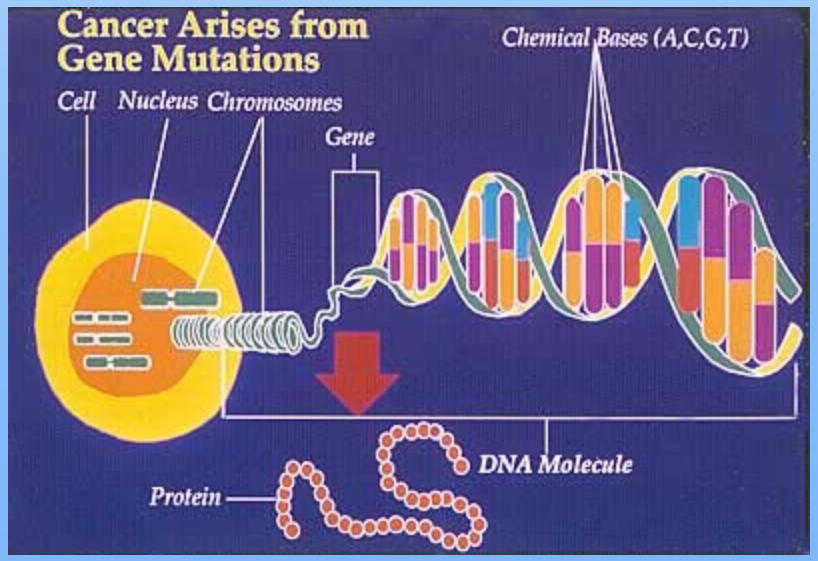
LESS ADHESION THE BETTER!!

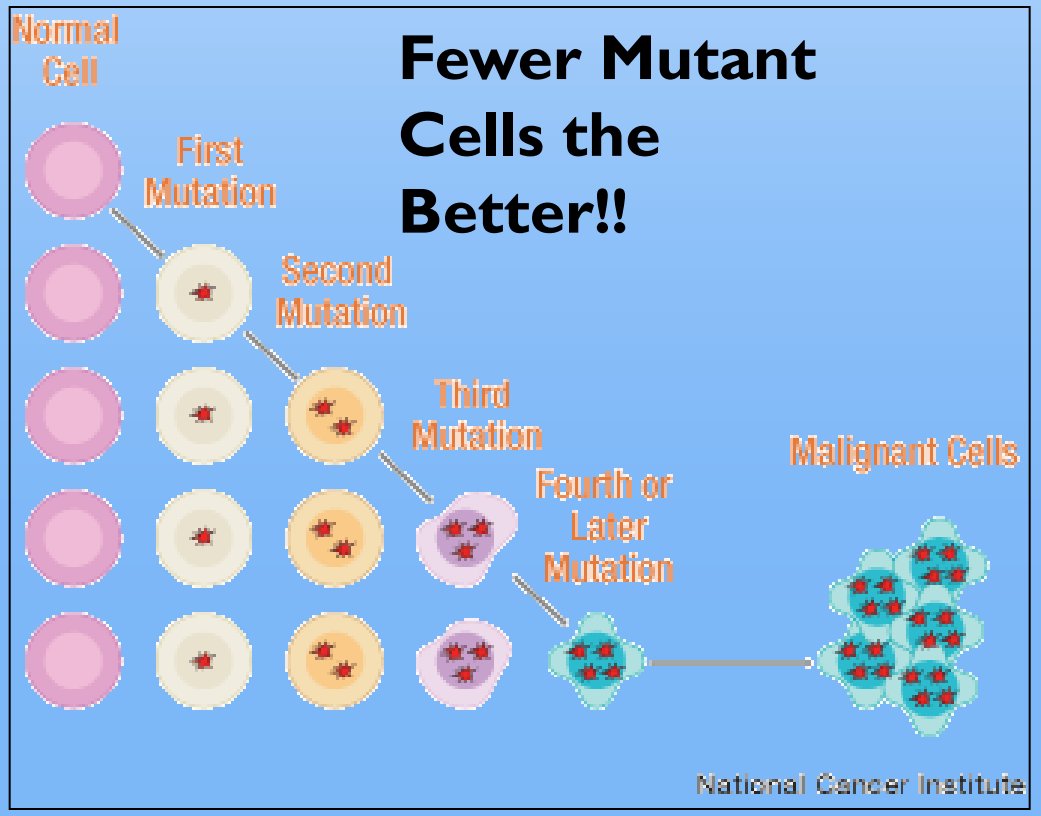
Colon Cancer Cells Adhesion & ALKA V-6



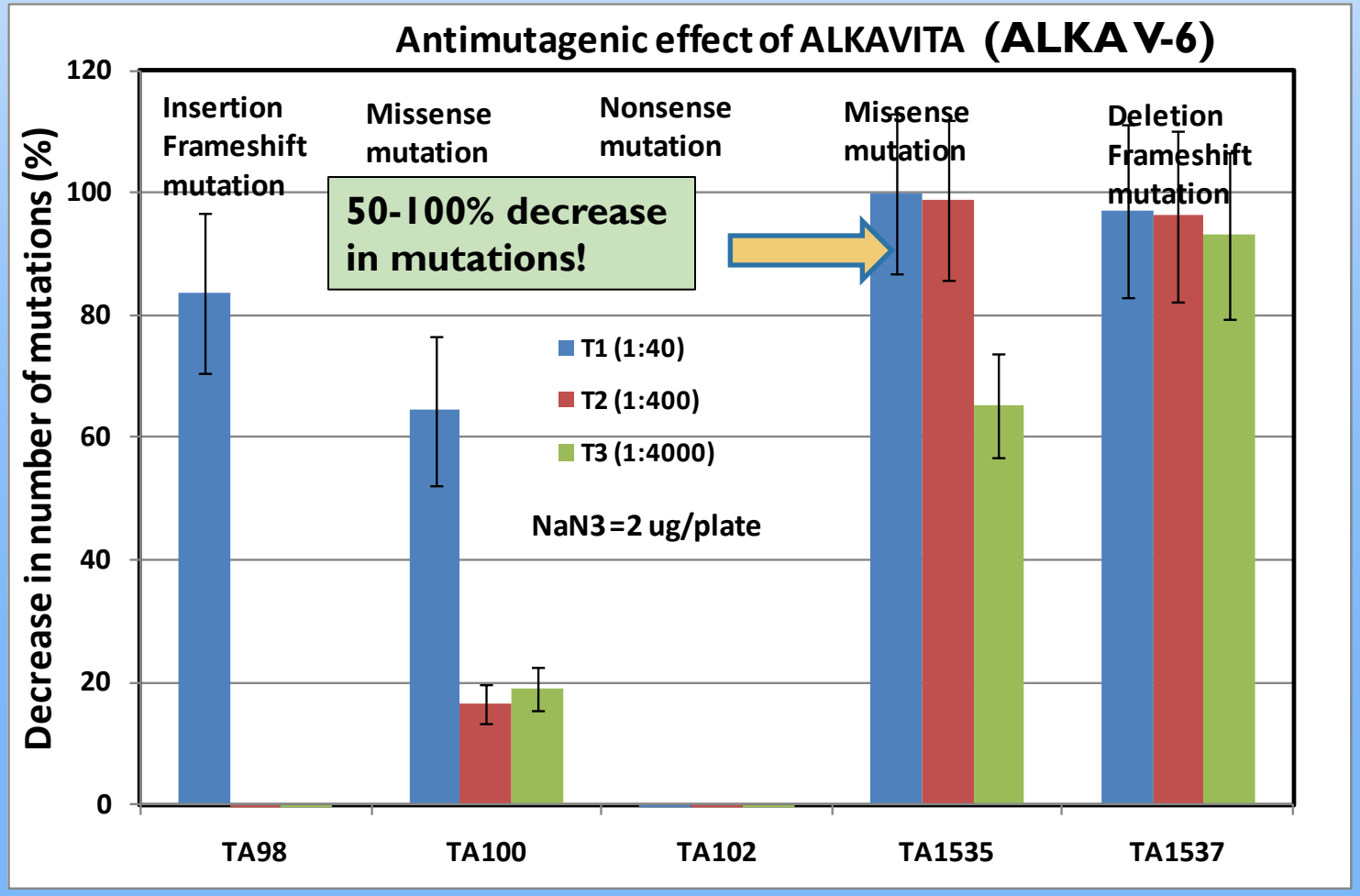
Mutations and Cancer

- Mutations Sometimes Lead to Cancer
- Caused by pollutants, toxins



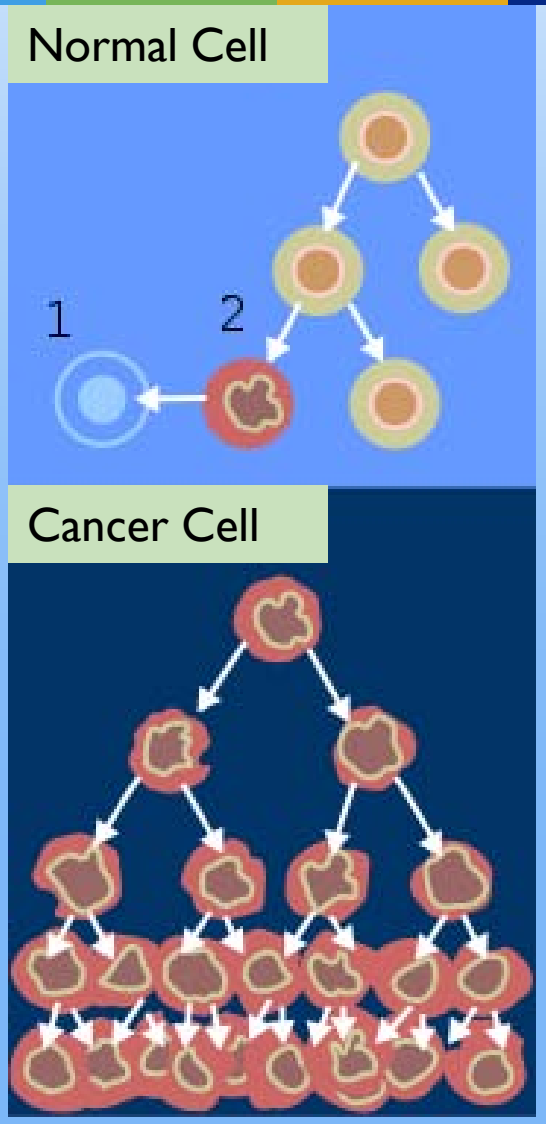


Mutagens & ALKA V-6



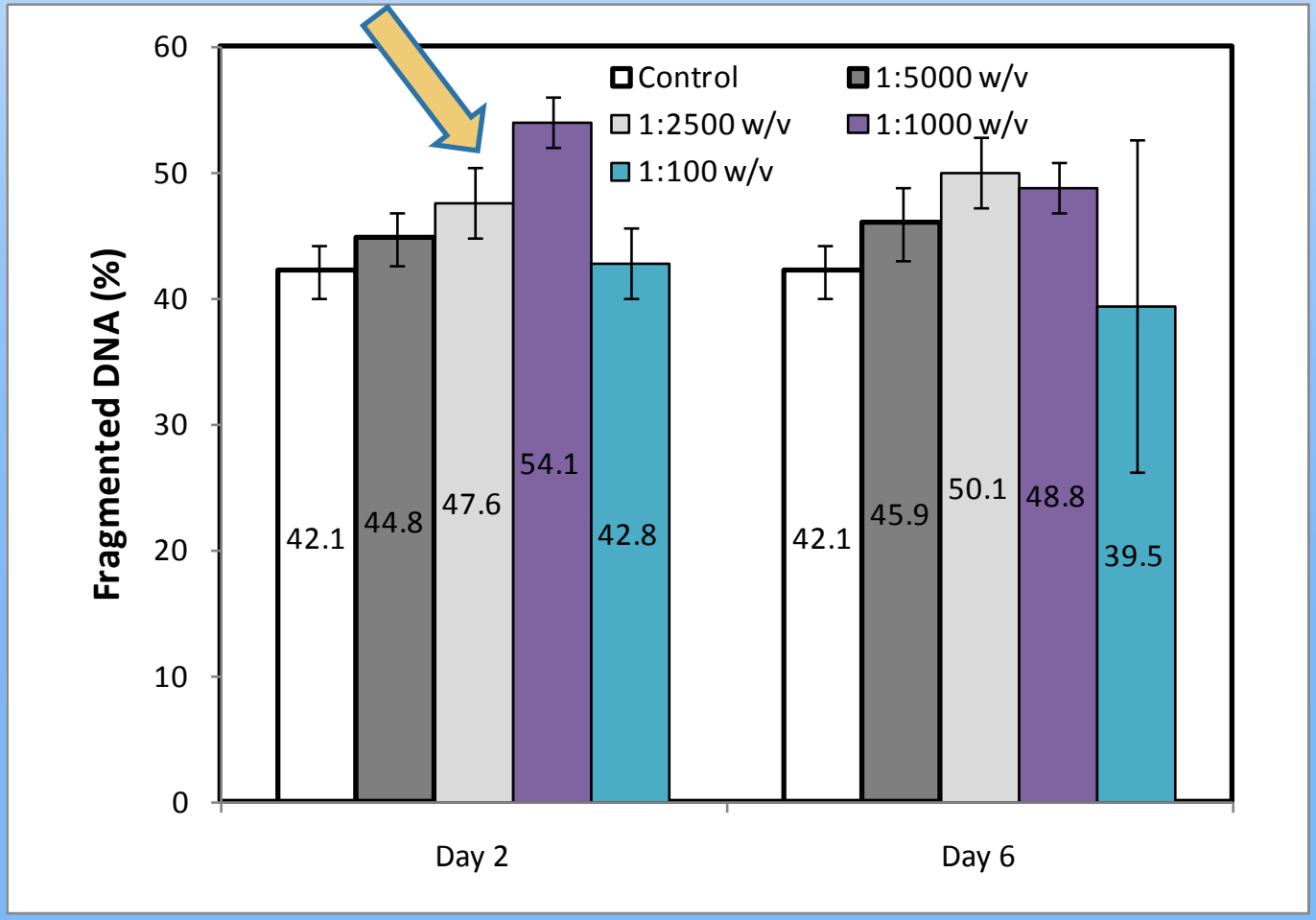
Apoptosis

- Programmed cell death
  - Cells normally age and die after a few divisions
- Defective
  - development and progression of cancer.
  - resistance to chemotherapy
- Selectively induce apoptosis in cancer cells
  - Measured by fragmented DNA



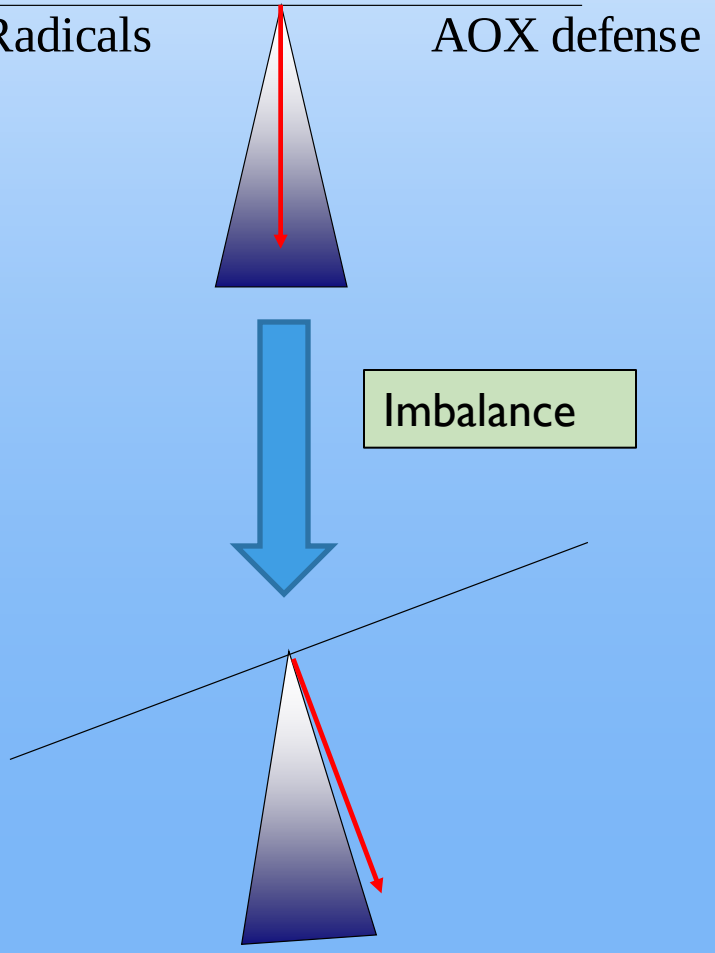
ALKA V-6 and Apoptosis

Apoptosis increased

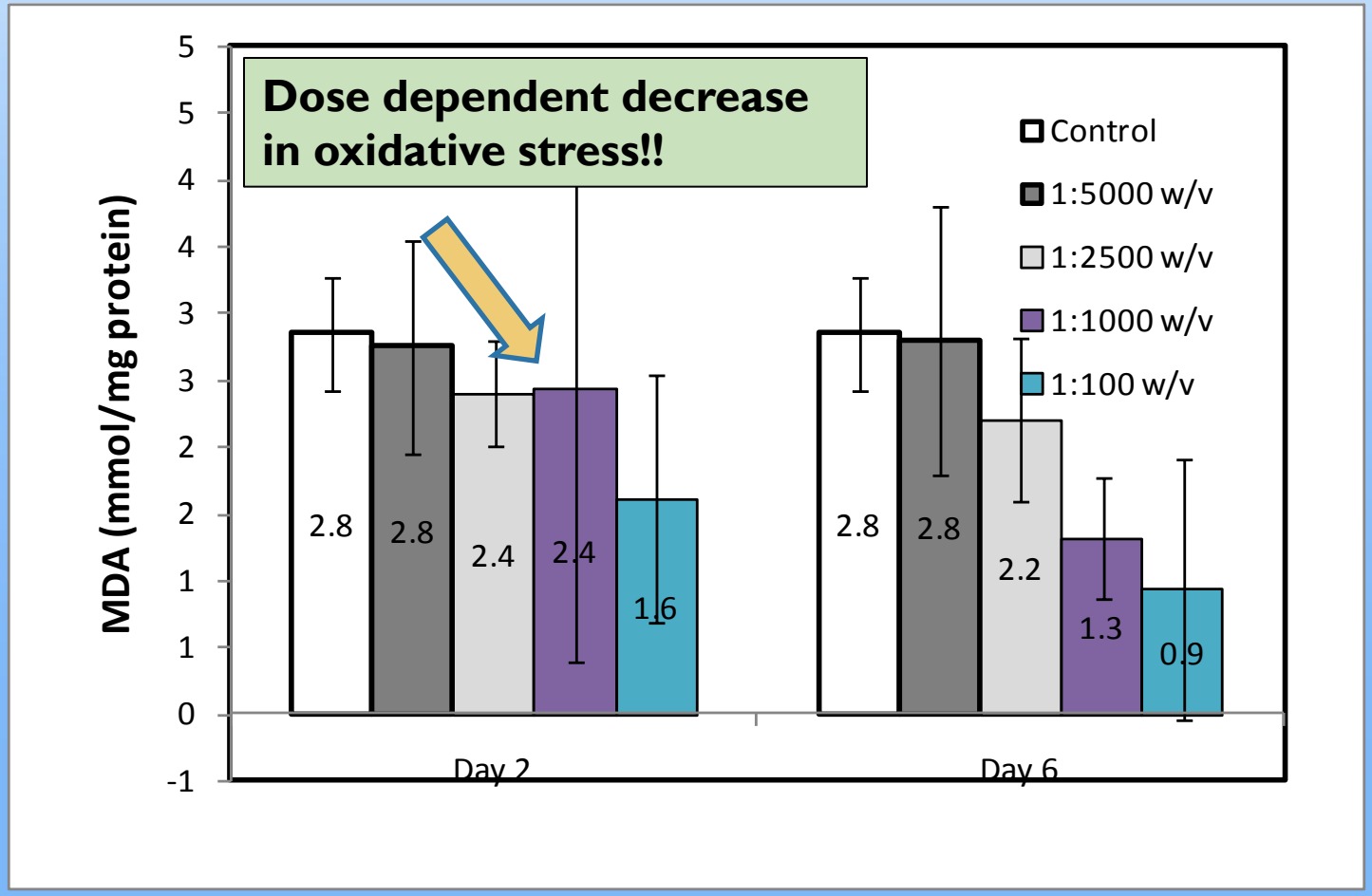


Oxidative stress

- Altered homeostatic balance resulting from oxidant insult
- Free radicals in the body overwhelm antioxidant defense systems
- Responsible for many diseases
- Cancer
- Decrease free radicals
  - Measured by MDA
- Increase antioxidant defenses
  - Enzymes
  - Chemicals



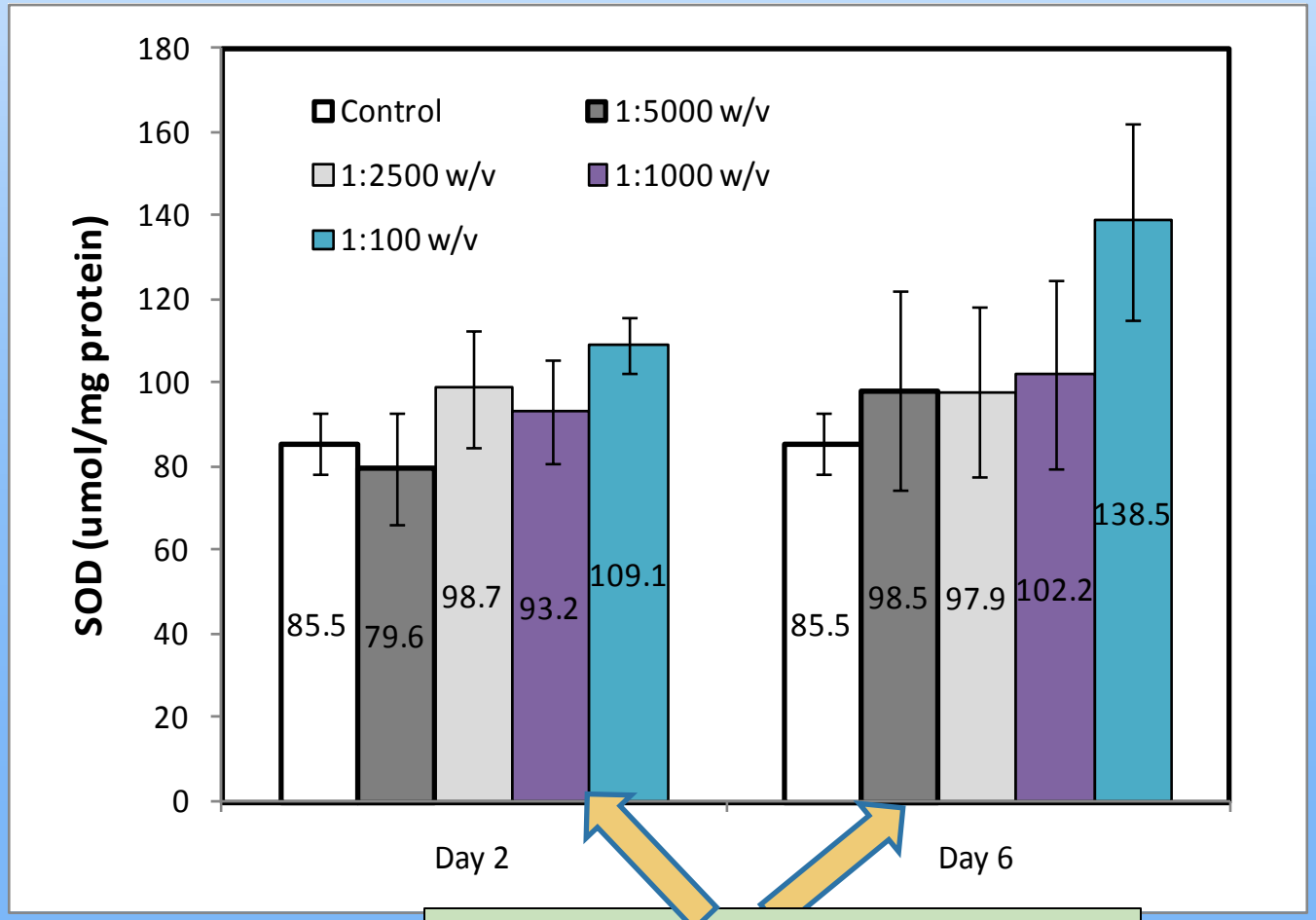
ALKA V-6 and Oxidative stress



SOD and CAT

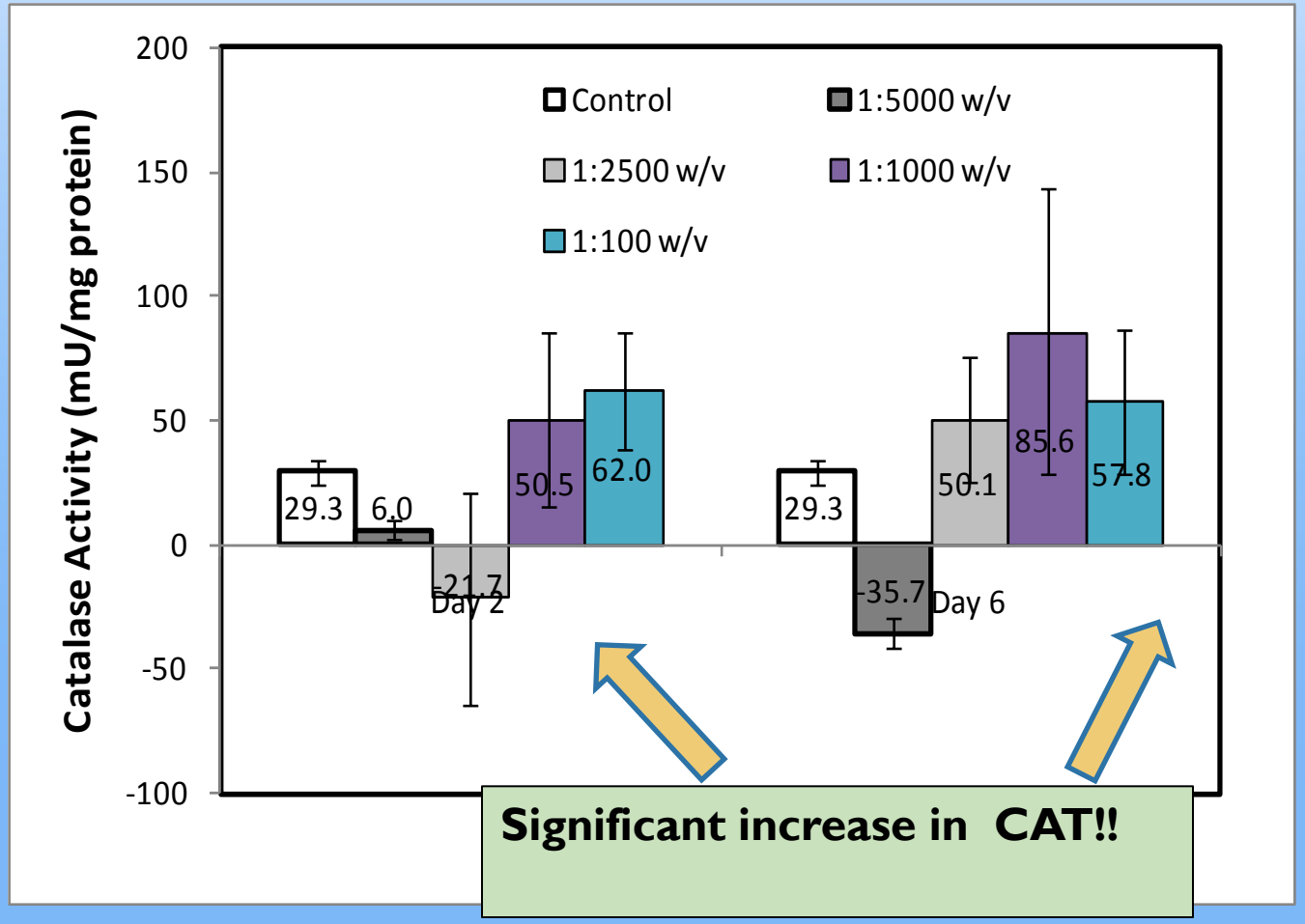
- Superoxide (O_2^-) and hydrogen peroxide (H_2O_2) are
  - Toxic compounds
  - If not removed can cause cancer
  - Superoxide is mopped up by superoxide dismutases (SODs)
  - Hydrogen peroxide is removed by catalase (CAT) and glutathione peroxidase.
  - Cancer cells have high levels of metabolism that Superoxide (O_2^-) and hydrogen peroxide (H_2O_2)
  - Low levels of SOD and CAT
- **Higher the levels of SOD and CAT the better it is!**

ALKA V-6 and SOD

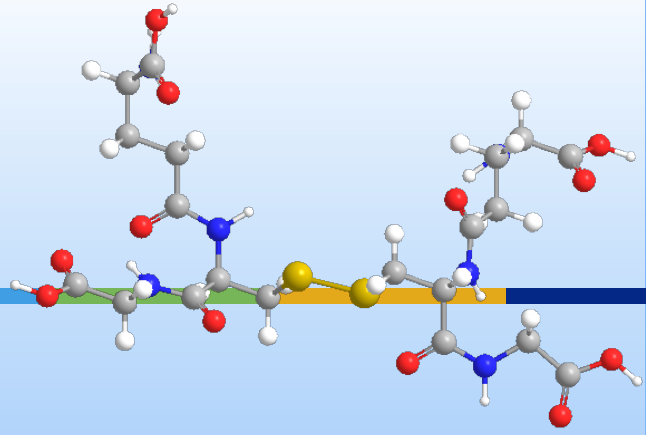


Dose dependent increase in SOD!!

ALKA V-6 and CAT



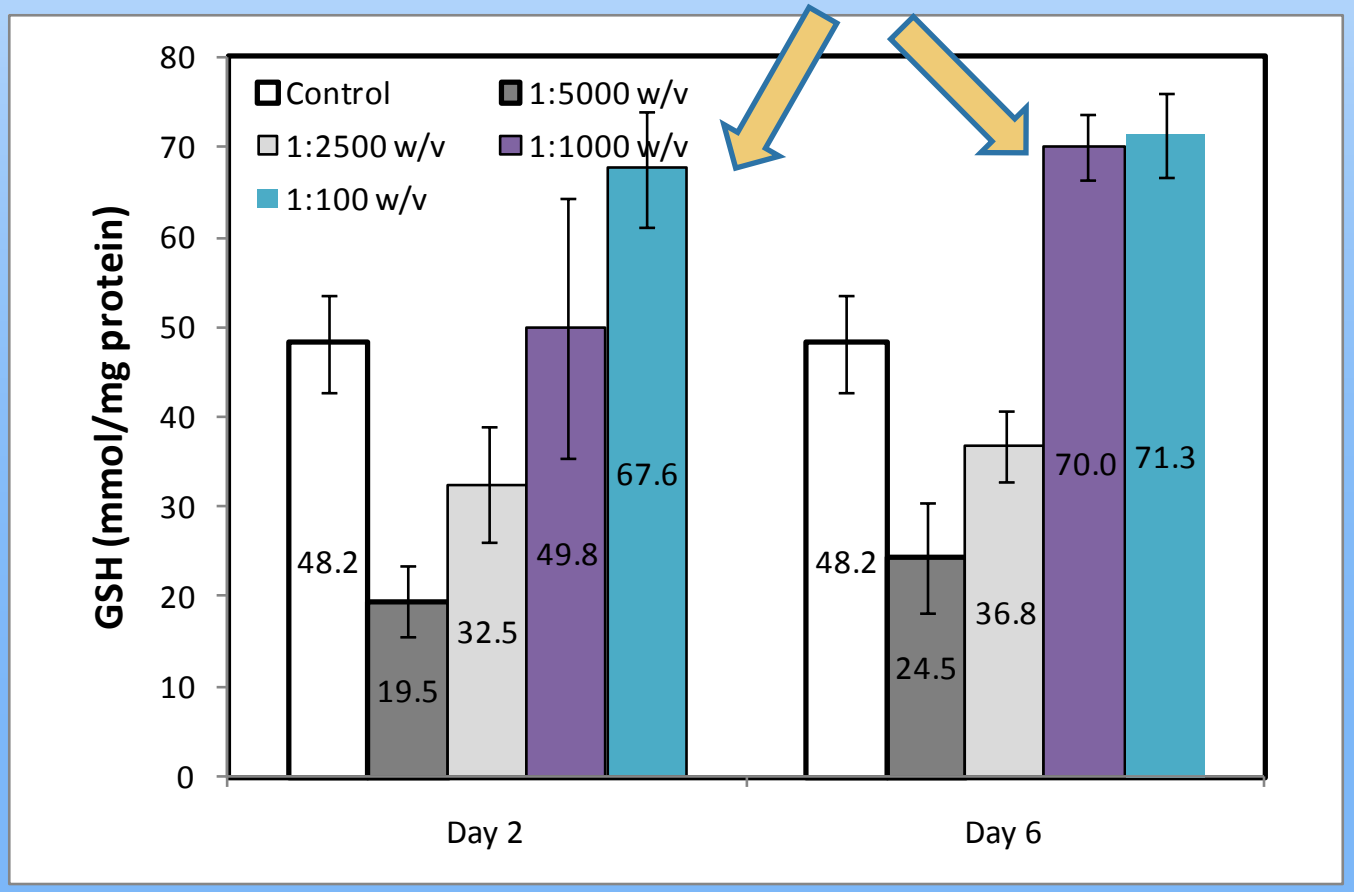
Glutathione



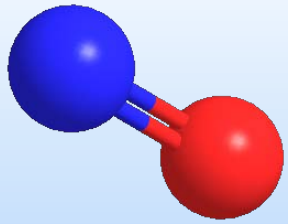
- Most important antioxidant
- Prevents conditions that can lead to diseases
  - Cancer
  - Cataracts
  - human immunodeficiency virus (HIV).
- Detoxify various harmful chemicals
  - Heavy metals and pollutants
- **MORE THE BETTER!**

ALKA V-6 & Glutathione

Dose dependent increase in GSH!!



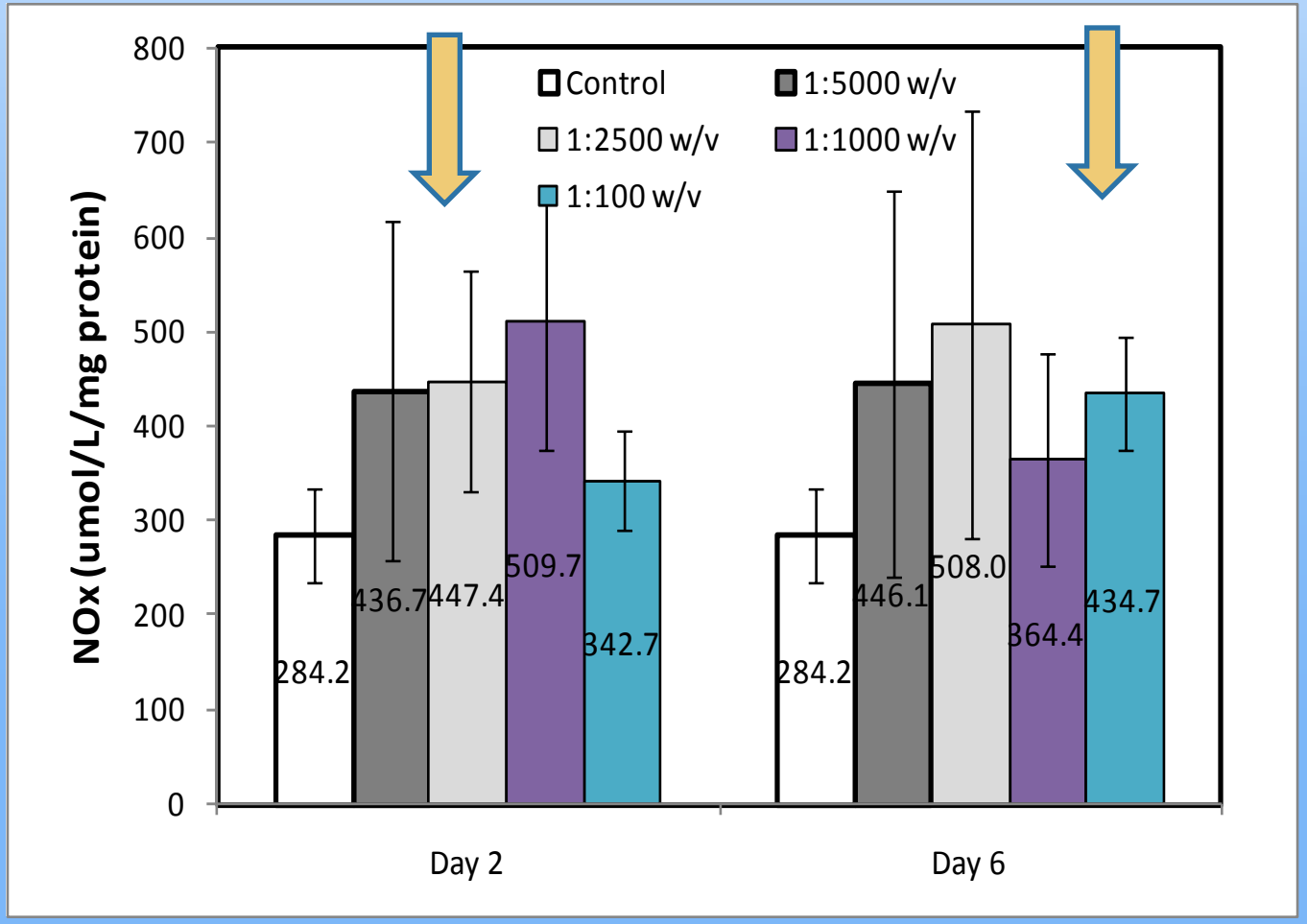
Nitric Oxide



- The immune system uses nitric oxide
  - fighting viral, bacterial and parasitic infections,
- Decreases proliferation of tumours
- Associated with learning, memory, sleeping, feeling pain, and, probably, depression.
- Inflammation and rheumatism.
- Reduce Blood Pressure
- Viagra
- **MORE THE BETTER!**

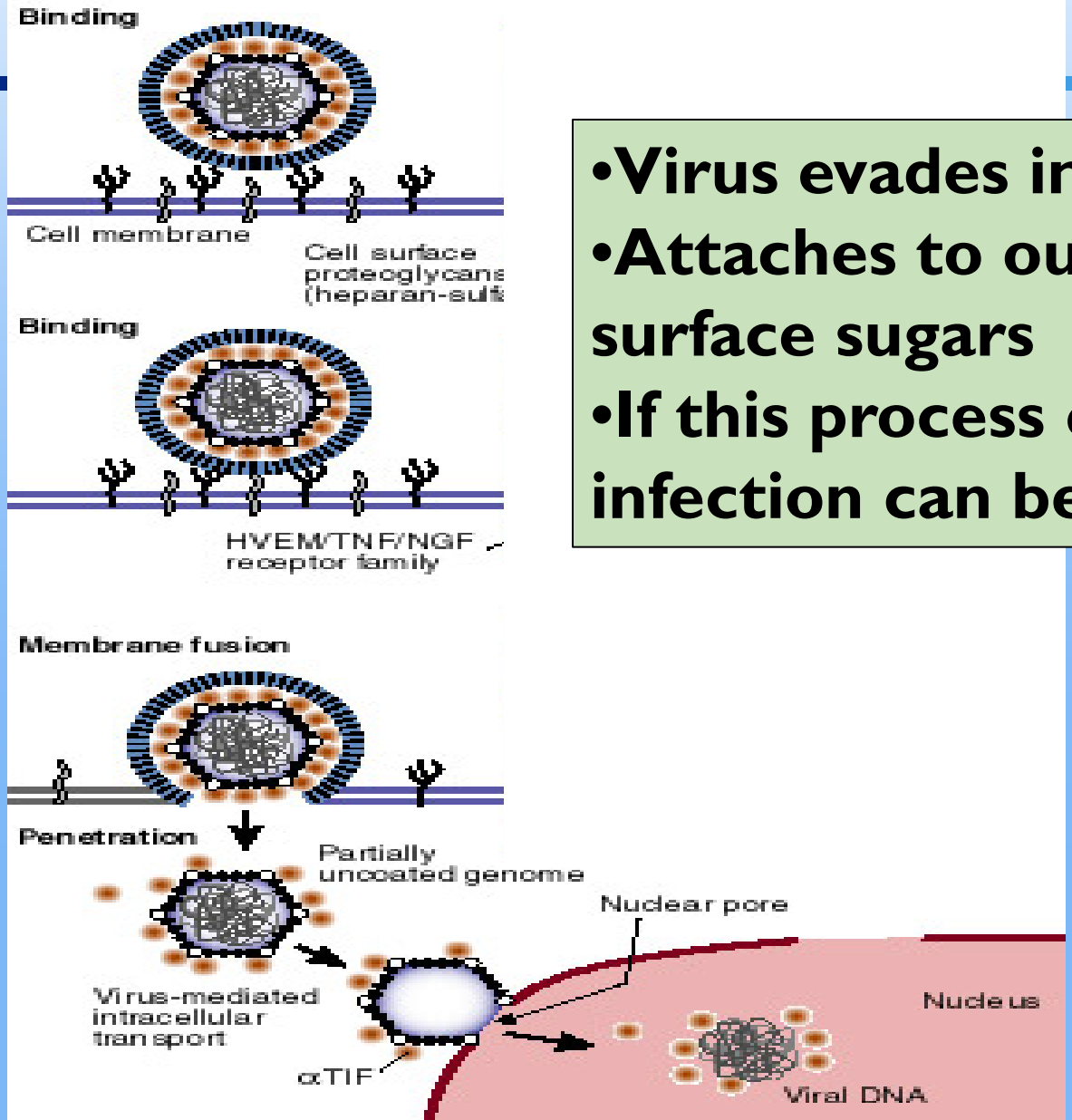
ALKA V-6 & Nitric Oxide

Significant increase in NOx!!



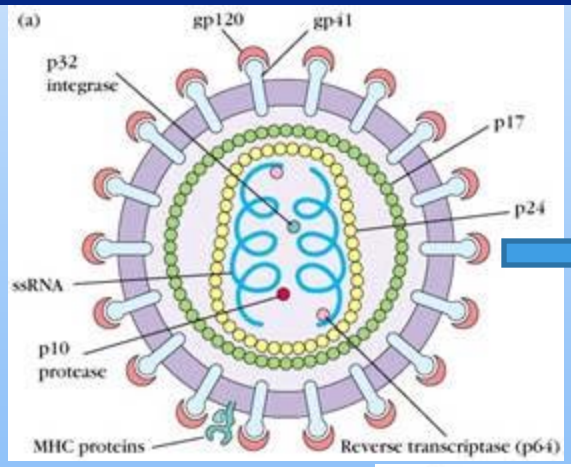
Anti-Retroviral effects

Anti Viral Drugs

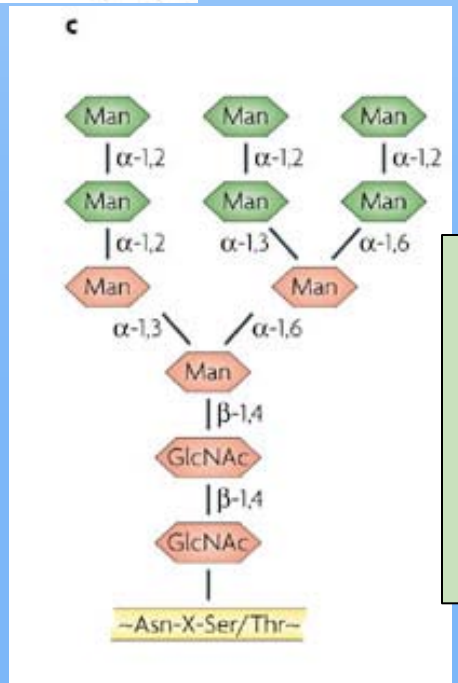


- Virus evades immune system
- Attaches to our cells using surface sugars
- If this process can be inhibited infection can be prevented

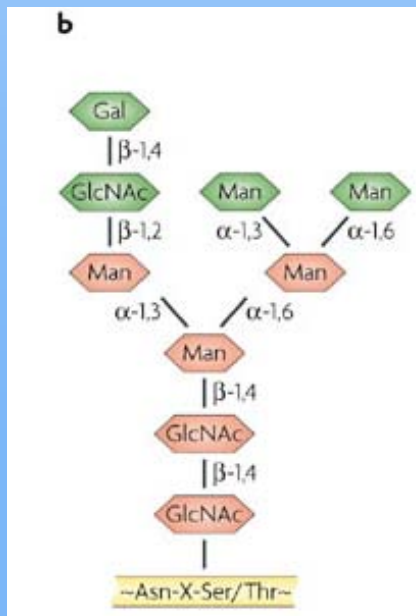
Viral Envelope



- Different sugars
- Determine the shape
- Shape can be changed by changing sugar composition



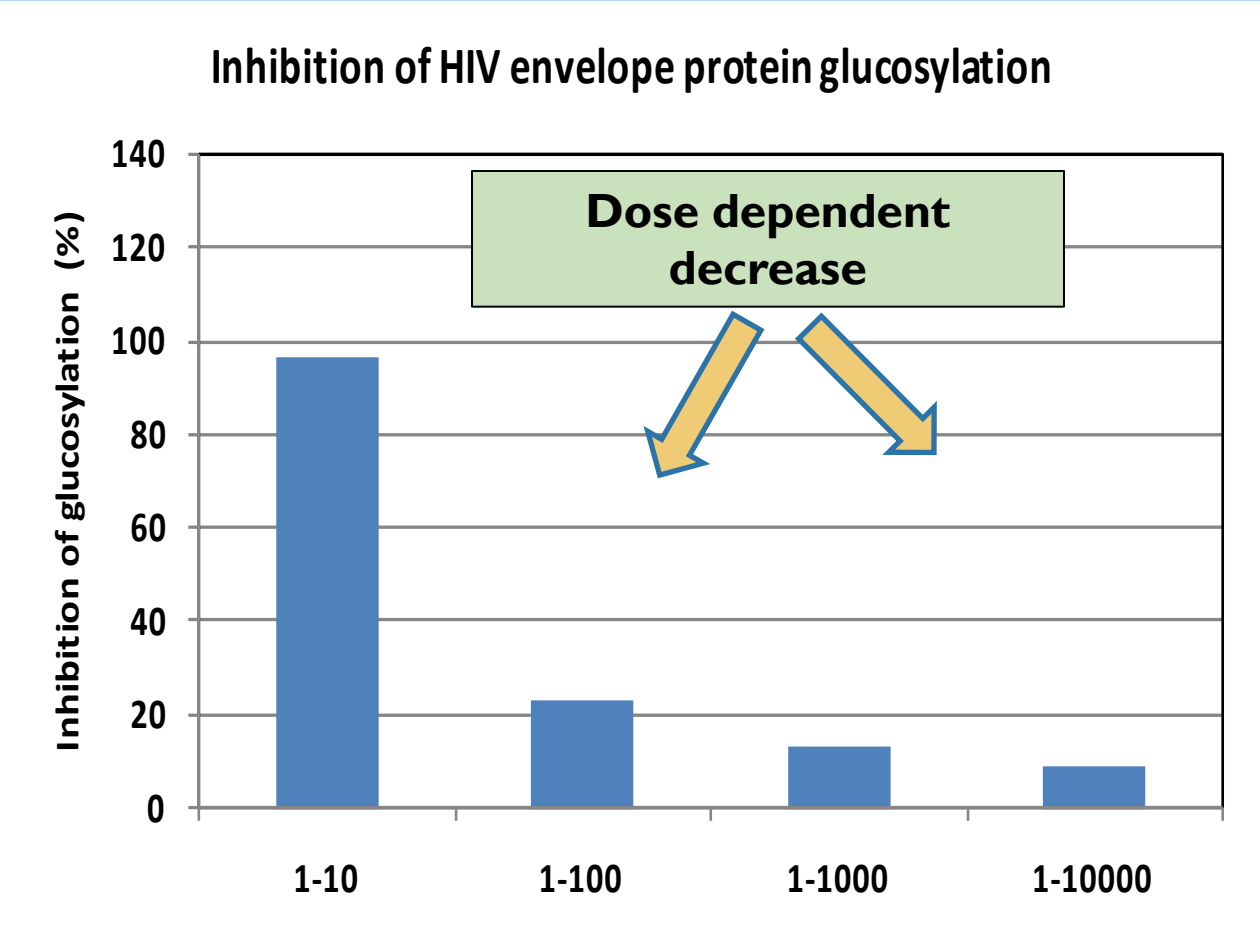
- If shape changes they can no longer bind to the cell receptor
- They cannot hide from immune system anymore



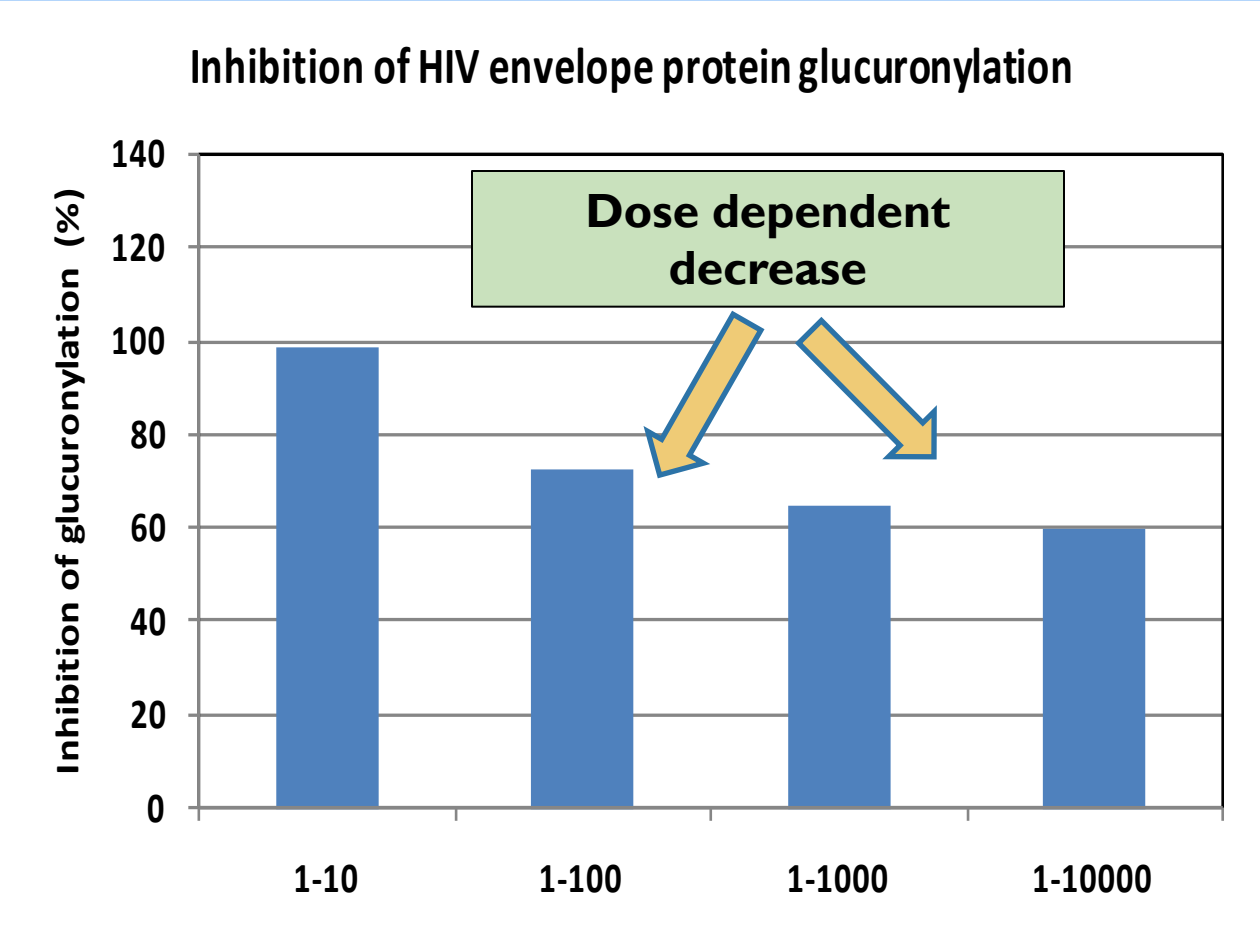
Glucohydrolase

- Glycohydrolase enzymes are found in the eukaryotic host cell's Golgi apparatus
- Inhibition has been found to decrease the infectivity of the HIV virion
- Two enzymes do this:
  - **Glucosidase**
  - **Glucuronidase**
- They add sugars to the viral envelope
- **More inhibition the better!!**

ALKA V-6 & Glucosidase

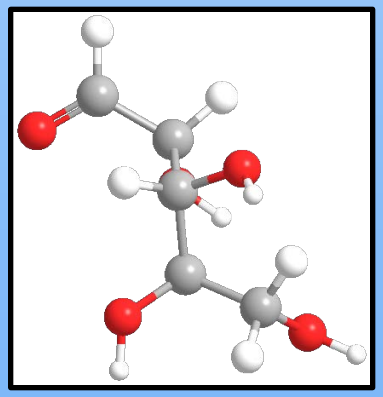


ALKA V-6 & Glucuronidase

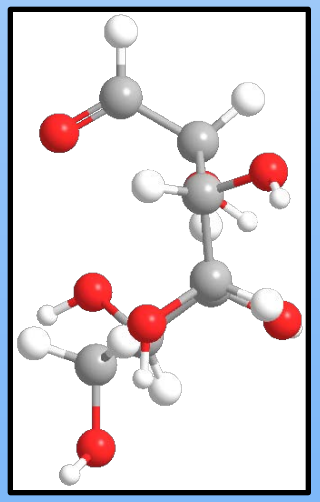


ALKA V-6 & Sugar composition

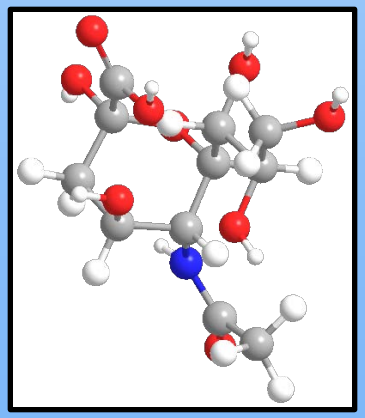
- Can ALKA V-6 effect the sugar composition ?
  - Looking or changes not increase/decrease



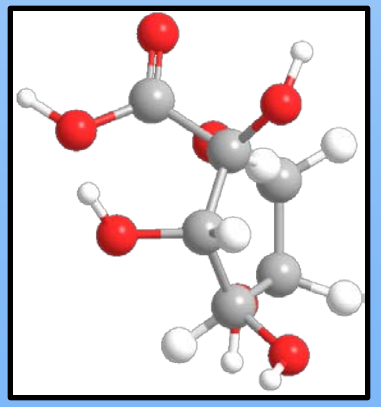
Ribose



Heptose

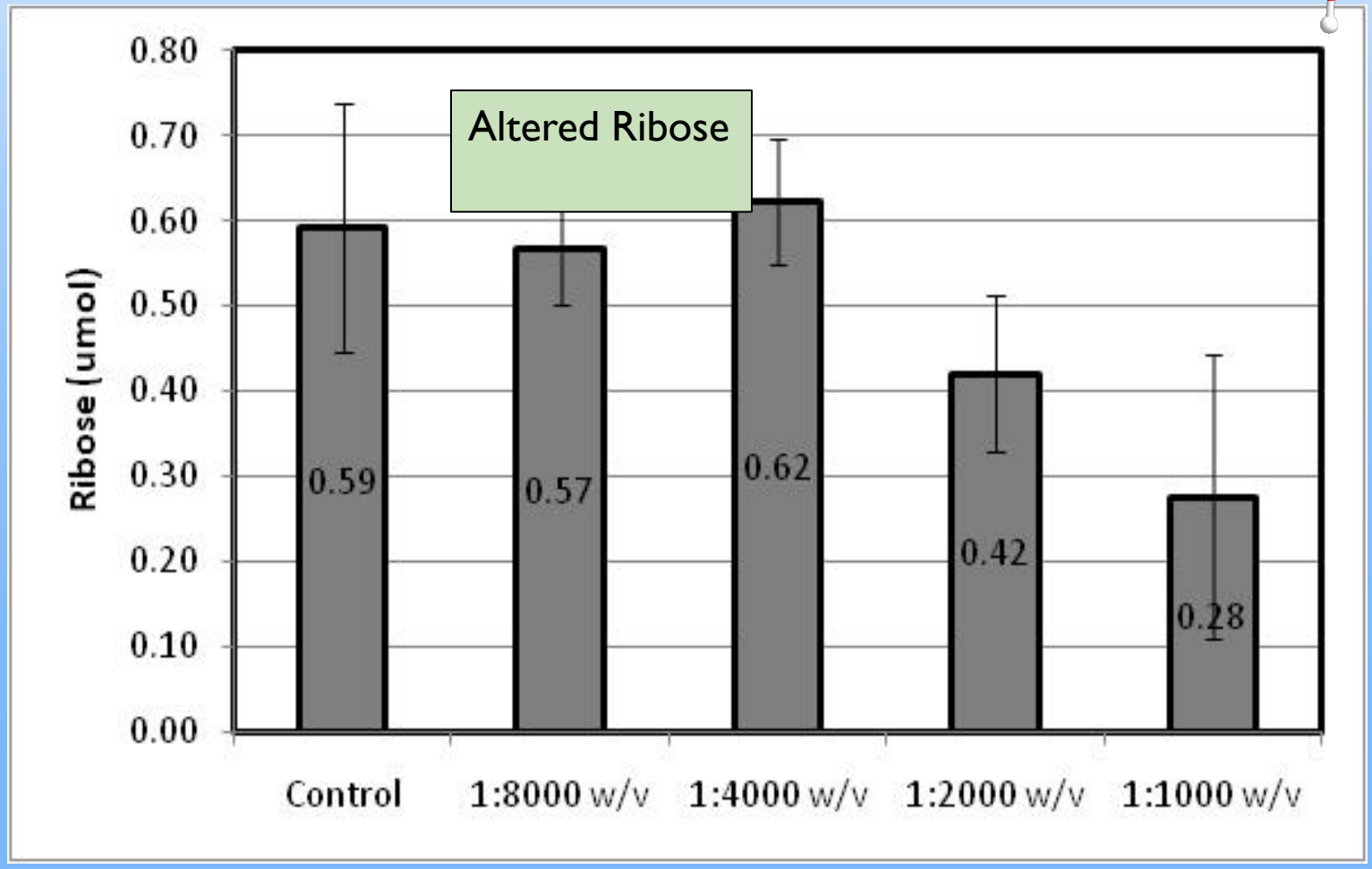


Sialic acid

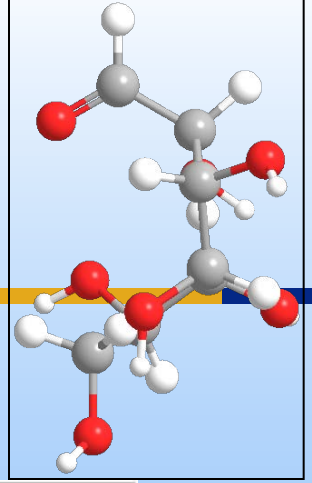


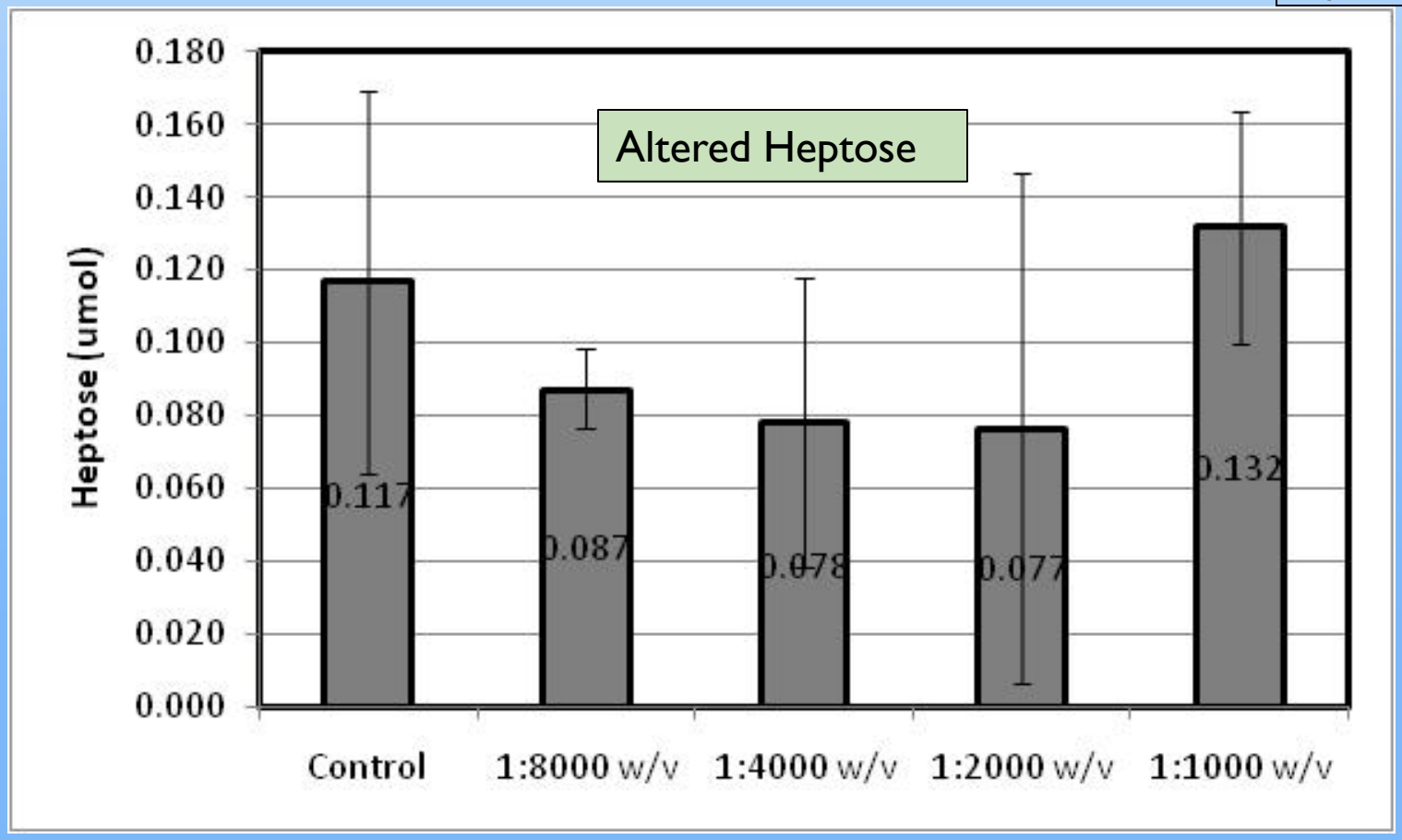
Uronic acid

ALKA V-6 & Ribose

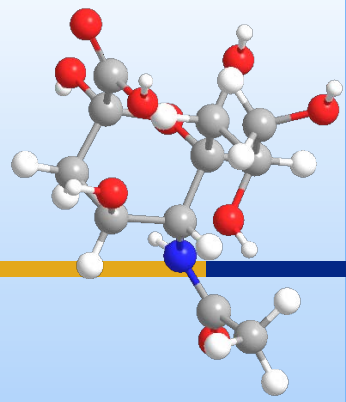


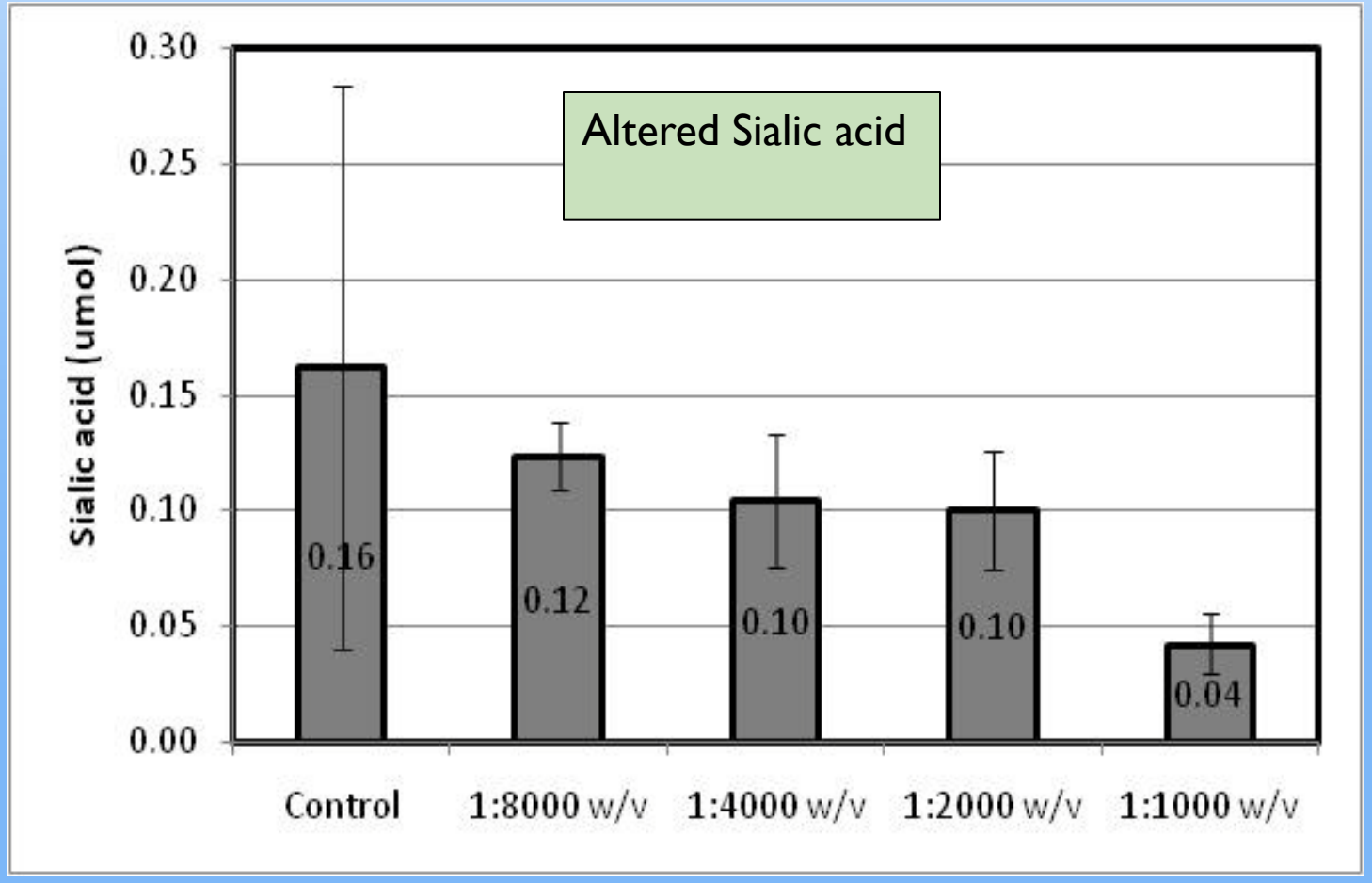
Heptose & ALKA V-6





Sialic acid & ALKA V-6





ALKA V-6 & Uronic acid