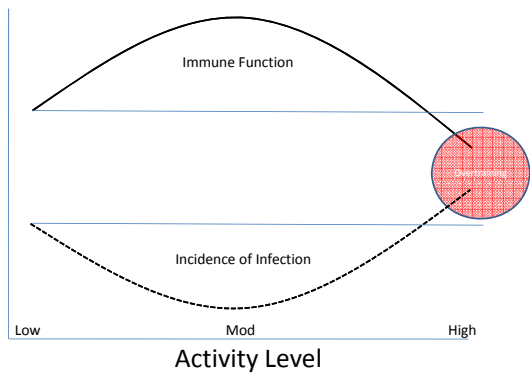


The Effects of Exercise on the Immune System

Alexander T. Hutchison PhD
Department of Exercise & Sport Science
St. Mary's University

J-curve



Nieman, DC (1994)

Immune System

Innate

Adaptive

Non-Specific

Specific

24-48 Hrs

> 48 Hrs

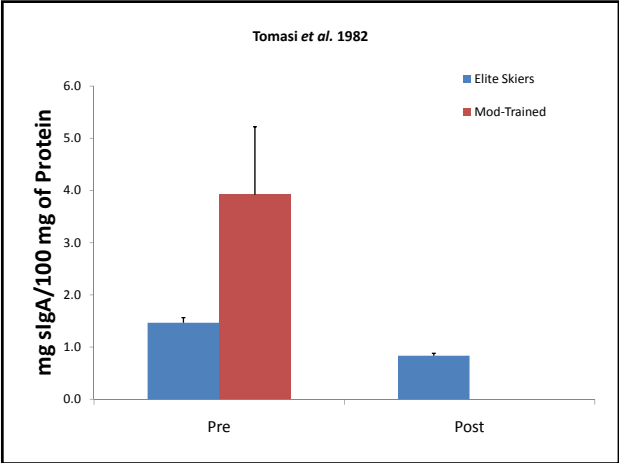
sIgA Levels

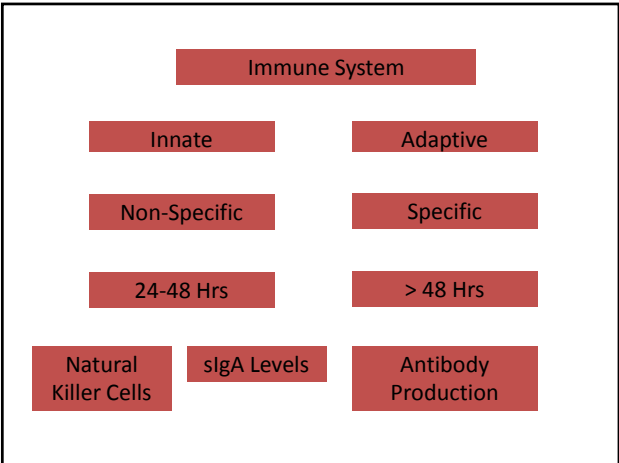
Antibody
Production

36th Annual Symposium On Sports Medicine

- Mucosal secretions
- Neutralization of
 - Viruses
 - Bacteria
 - Toxins
- ↓ post exercise

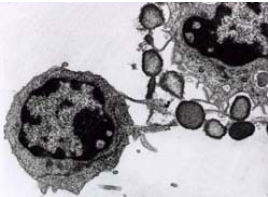
Figure 9-22 Immunobiology, 6/e. © Garland Science 2005



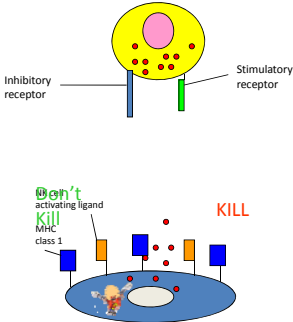


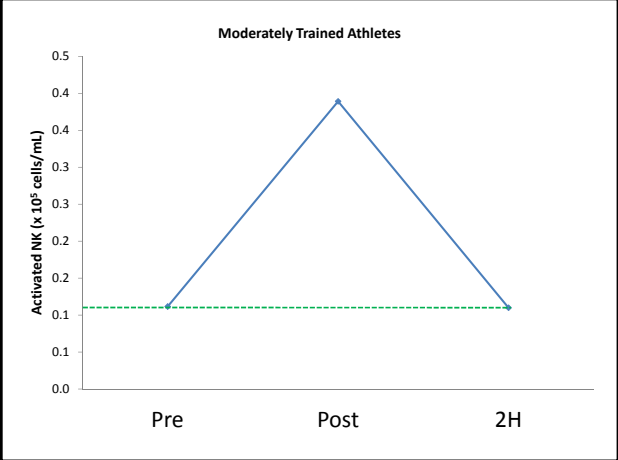
What are Natural Killer Cells?

- Large, granular lymphocytes of the innate immune system
- Eliminate virally infected/cancer cells
 - circulating concentration
 - cell activity (NKCA)

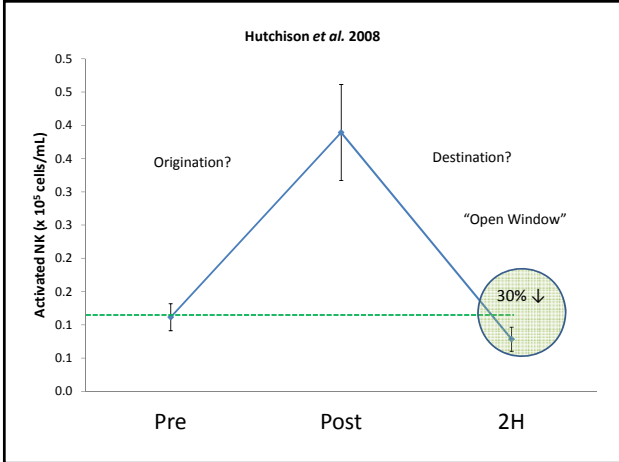


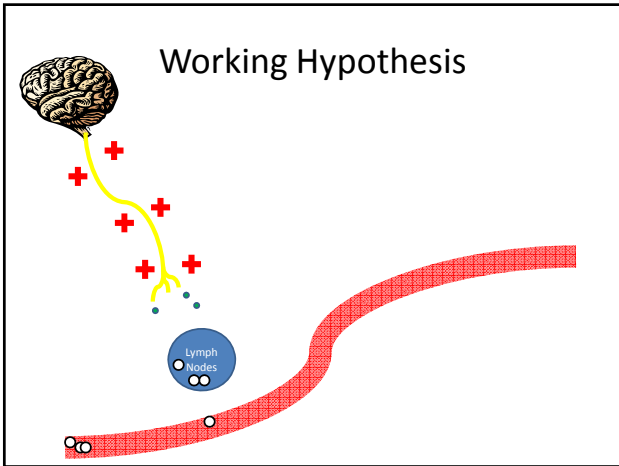
Janeway, 2005





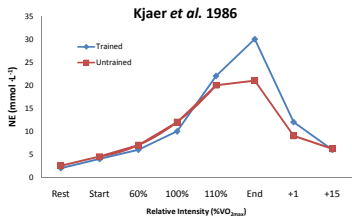
36th Annual Symposium On Sports Medicine





Possible Causes

- ↑ catecholamine release
 - Maintain blood glucose
 - Regulate blood flow
 - ↑ Q
 - ↑ HR and SV
- Training ↑ Catecholamine release at high intensity



Countermeasures

- Vitamin C
- Antioxidants
- BCAA
- Acupuncture
- CHO Supplementation

Future Study

- Previous work involved circulating NK cells
- Where do they come from/go?
- What is their normal function in other tissues?
- What is their normal activity level in other tissues?

Animal Study

- Extract tissue
 - Spleen
 - Lymph Nodes
 - Lungs
 - Intestine
 - PEC
- Determine normal location and function



36th Annual Symposium On Sports Medicine

Advice for Athletes/Coaching

- Increase intake of vitamins and antioxidants
- Consume CHO/prot during exercise >60 min
- Wash hands
- Stress management
- Sleep
- Cut back volume during periods of “hi stress”
 - Finals
 - Start of semester
- **Don't let sick athletes train with the team!**

Questions?

- References
 - Neiman, D.C., *Int J Sports Med*, 1994. **15**:S131-S141
 - Janeway, C.A., *Immunobiology*, 6 ed. 2005
 - Tomasi, T.B. *et al.*, *J Clin Immun*, 1982. **2**(3), 173-78
 - Hutchison, A.T. *et al.*, *J Ex Phys*, 2008. **11**(5), 42-50
 - Kjaer, M. *et al.*, *J Appl Physiol*, 1986. **61**(5), 1693-1700
