

## Human study

 **Clarinol**<sup>TM</sup>

**Immune modulation**

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# Content

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- **Introduction: CLA and immune modulation**
- **Objective**
- **Study design**
- **Study parameters**
- **results**
- **Conclusions**

# CLA: Immune modulator

## Immune disbalance

### Chronic-/ acute inflammation

- Allergy

- Humoral IR
  - Antibody: IgE↓
- Histamine ↓

- Infection

- Humoral IR
  - Antibodies
- IL1, PGE2



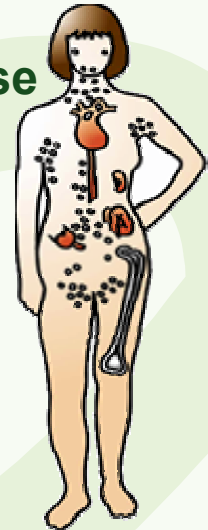
## Immune disbalance

### Infection model: Vaccination

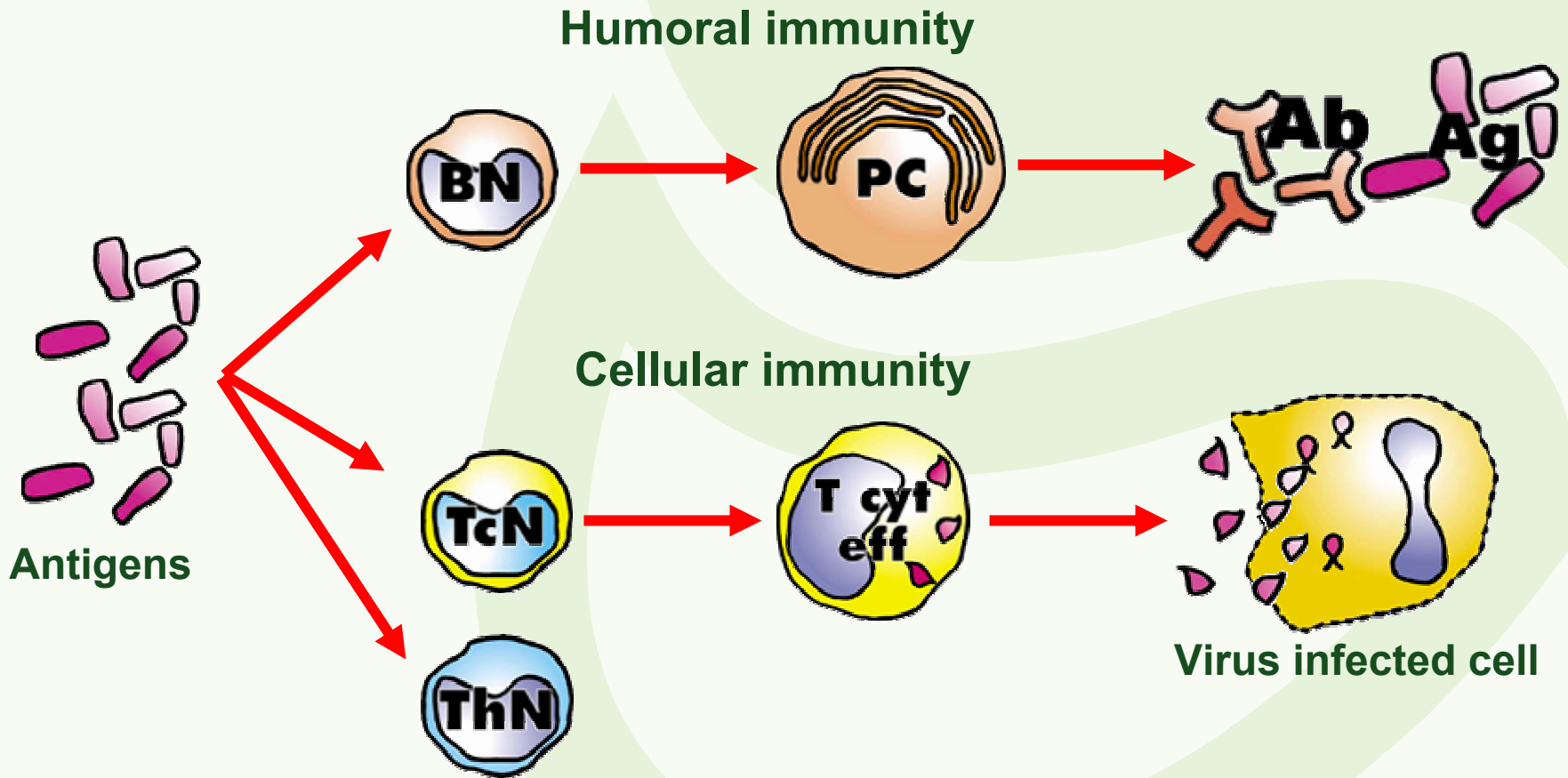
Specific  
Immune response



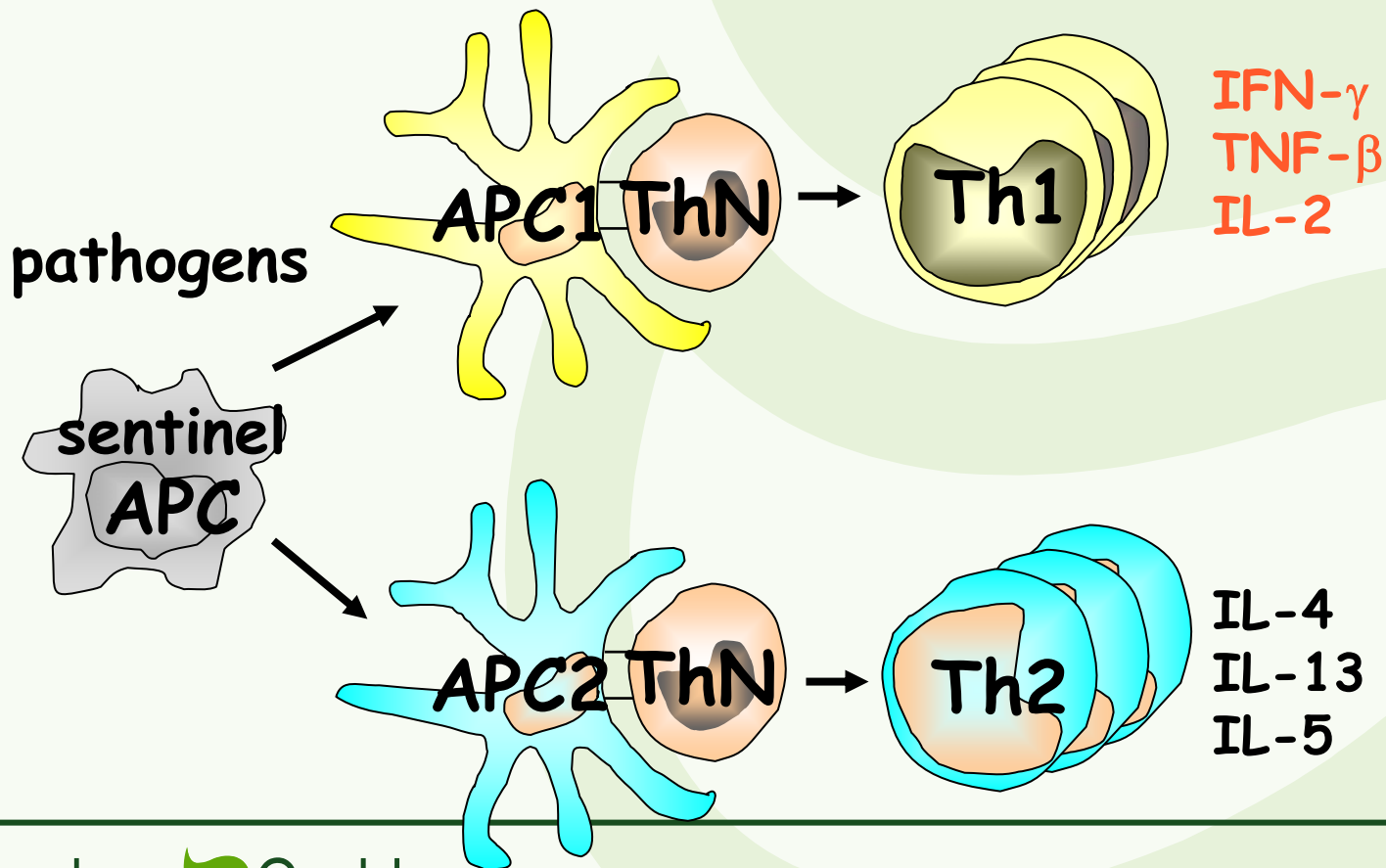
- Humoral IR
  - Antibodies
- Cellular IR
  - DTH

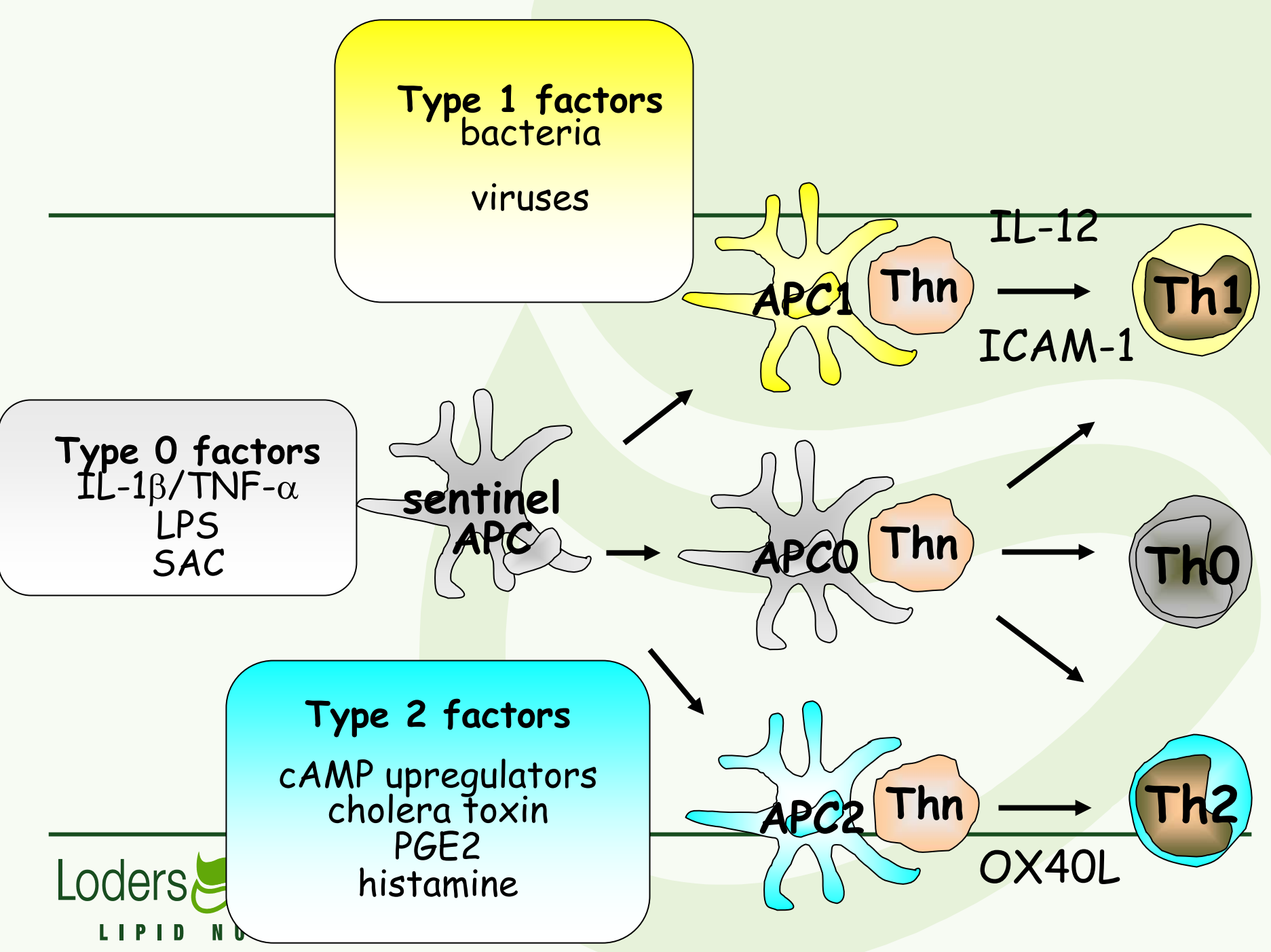


# Specific immune system



# Role APC in Th cell function





# Objective

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- **Treatment**

- 50:50 c9, t11-CLA : t10, c12-CLA
- 80:20 c9, t11-CLA : t10, c12-CLA
- Placebo - high oleic sunflower oil (HOSF)

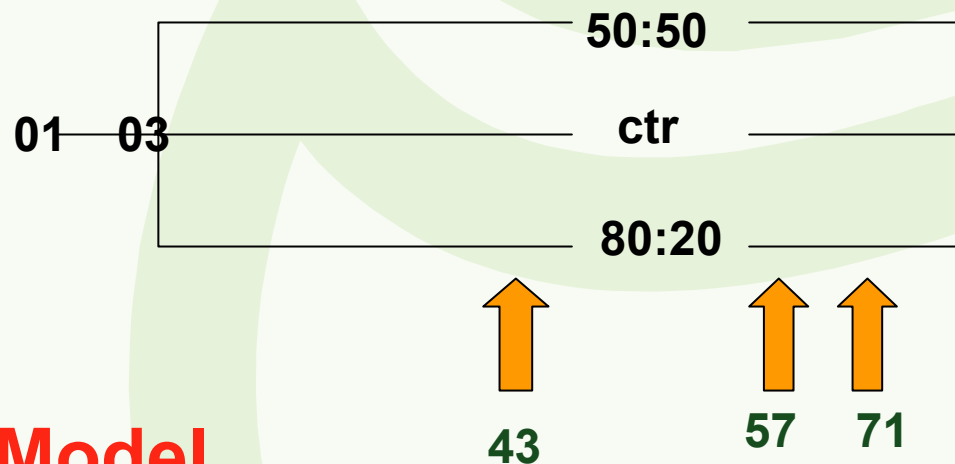
- **Human**

- Humoral immune response
- DTH (Delayed type hypersensitivity) reaction

# Study Design

## Study design

- Randomised, parallel, double-blind trial



## Infection Model

- Vaccination (Hepatitis B)



# Study Design

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- **75 Subjects**

- 50:50 (3 g CLA/d)
- 80:20 (3 g CLA/d)
- Placebo (3 g HOSF/d)

- **13 week duration**

- Staggered start over 3 cohorts



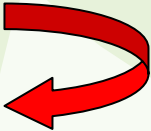
# Main Dynamic Immunological Parameters


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- **Examination of a specific immune response**

1. (DTH) recall antigens involves memory:  
existing T-cells

2. (Anti-Hb) Active immune response :

T-helper cells 

B-cells 

Specific Antibodies

## **II Additional dynamic parameters**

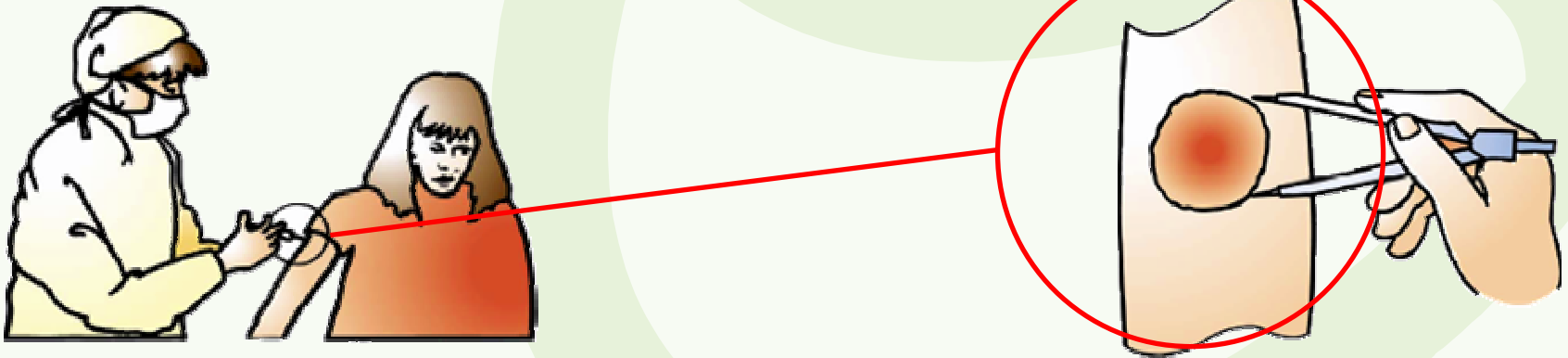
3. CLA composition of white blood cells

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# 1. Delayed-Type Hypersensitivity

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- Cell-mediated immune response
- Minor dose under skin
  - Tetanus, Diphtheria, Tuberculin, Streptococcus, Candida (albicans), Proteus (mirabilis), Trichophyton (mentagrophytes)



## 2. Anti-Hepatitis B

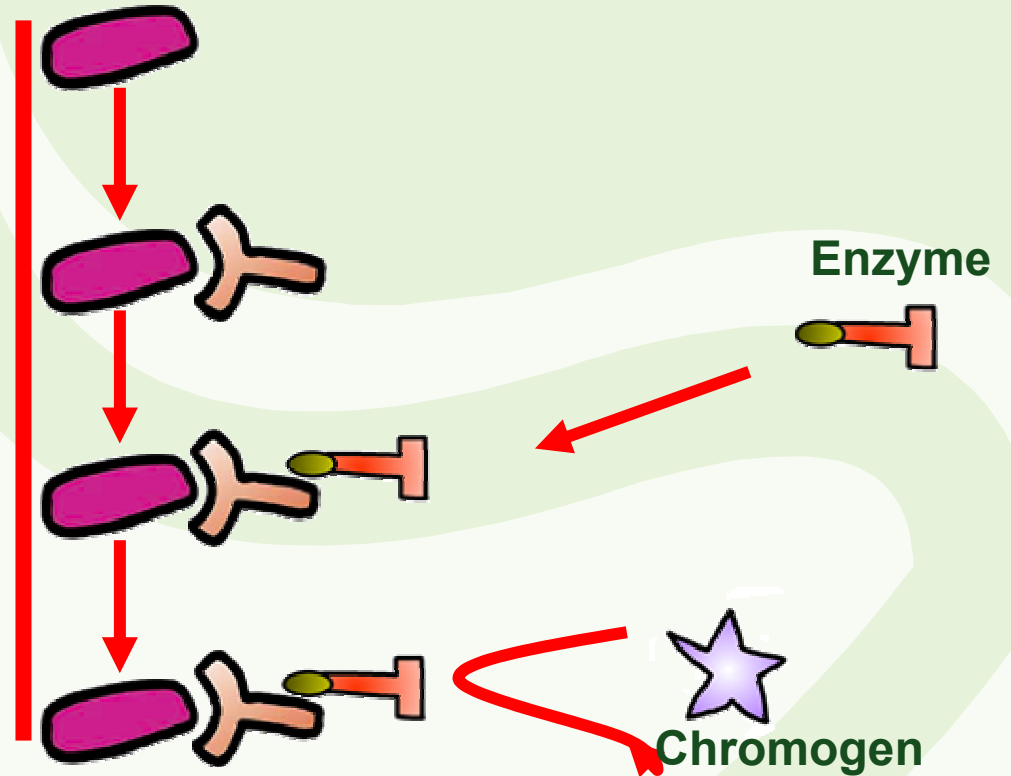
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- Vaccinated (Serum anti HB antigen titres)
  - pre study
  - wk 11
  - wk 13
- 2 weeks post vaccination
  - anti HBs antibodies determined



# 1. Anti-Hepatitis B

- Sensitise plate with antigen
- Wash
- Add test antibody
- Wash
- Add ligand
- Wash
- Add chromogen
- Develop plate



# Results 1

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- Seroprotection rate

- CLA 50:50 is 62.5%
  - CLA 80:20 is 36.4%
  - Ctr is 33.3%
- } ns } p=0.05

- Conclusion

- 50:50 CLA enhanced the **active** humoral immune response (antibody production)
- CLA has a positive effect on the specific immune system in humans

# Results 2

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- DTH (recall Ag's):
  - Within normal range (start, end)
  - No stat.sign. differences between groups
  
- Conclusion
  - CLA did not affect **existing** cellular immune responses

# Conclusion

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- **FA composition of PBMC:**
  - total CLA ↑
- **CLA did not affect existing cellular immune responses**
- **Seroprotection rate between CLA 50:50 group and controls enhanced (P=0.05).**



# Conclusions I

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The end-points induced clear **in-vivo** immune response.

## Acute immune response

- CLA 50:50 significantly increases the number of responders for antibody production and antigen specific proliferation of lymphocytes.
- CLA 80:20 did not show any significant effect.
- Seroprotection rate between CLA 50:50 group and controls was significantly higher ( $P=0.05$ ).

# Conclusions II

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## Memory immune response:

- CLA had no significant effect on *ex vivo* mitogen (PHA) induced proliferation
- CLA had no effect on existing cellular responses as measured by the DTH reaction (existing T cell respons

# Acknowledgment

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