

A possible solution to the problem of obesity?

Objectives

- Define brown adipose tissue (BAT) and its thermogenic activity.
- Explain the factors that regulate its activity.
- Define futur therapeutical approaches that can be applied to solve the obesity problem.

1. Features and importance of BAT

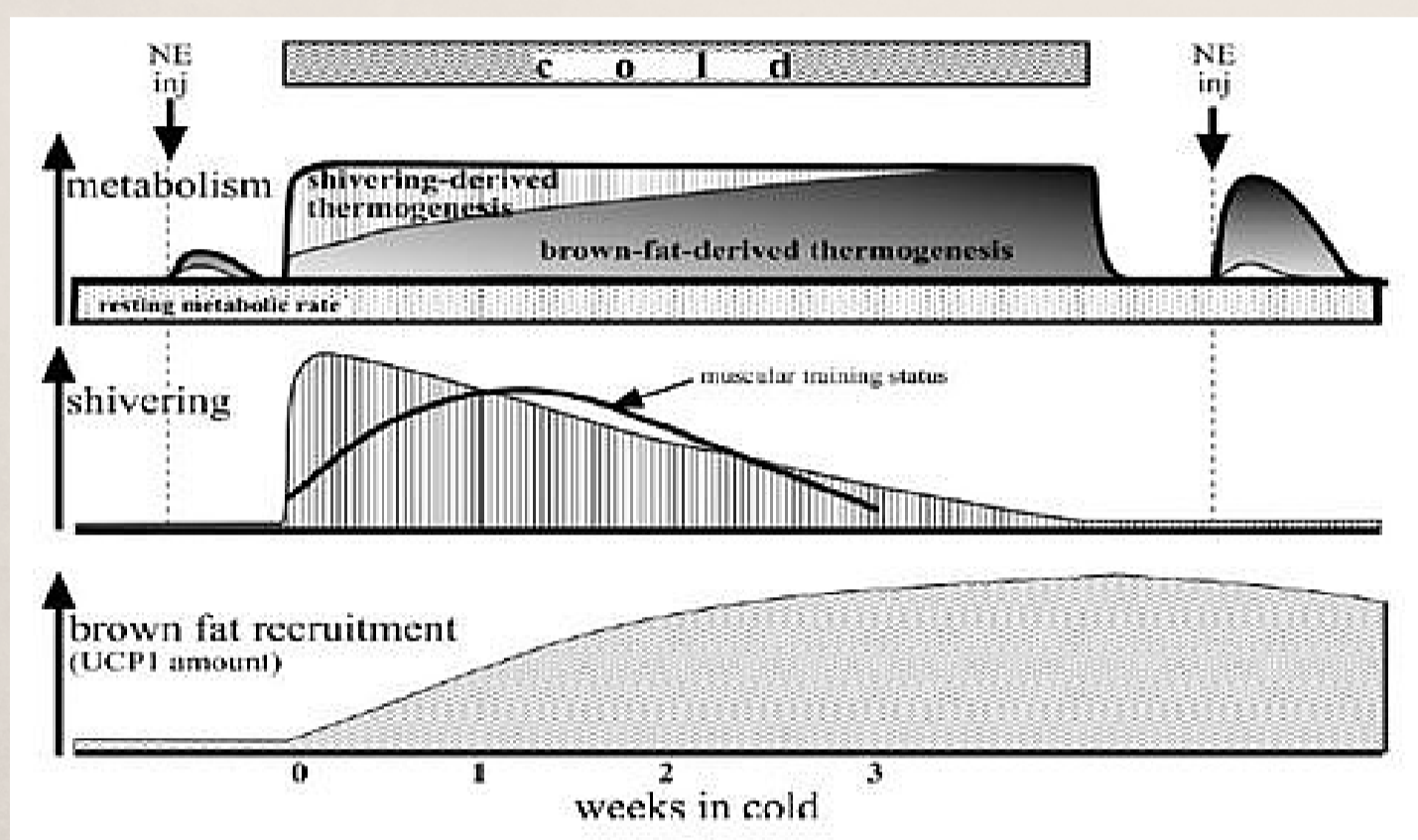


Figure 1. Metabolic responses to cold. Extracted from: Cannon B. and Nedergaard J. 2004, 84: (277-359)

1. Cold exposure
2. Shivering thermogenesis
3. Recruitment of BAT (increasing the amount of UCP-1)
4. Brown-fat-derived thermogenesis

2. Localitzation of BAT

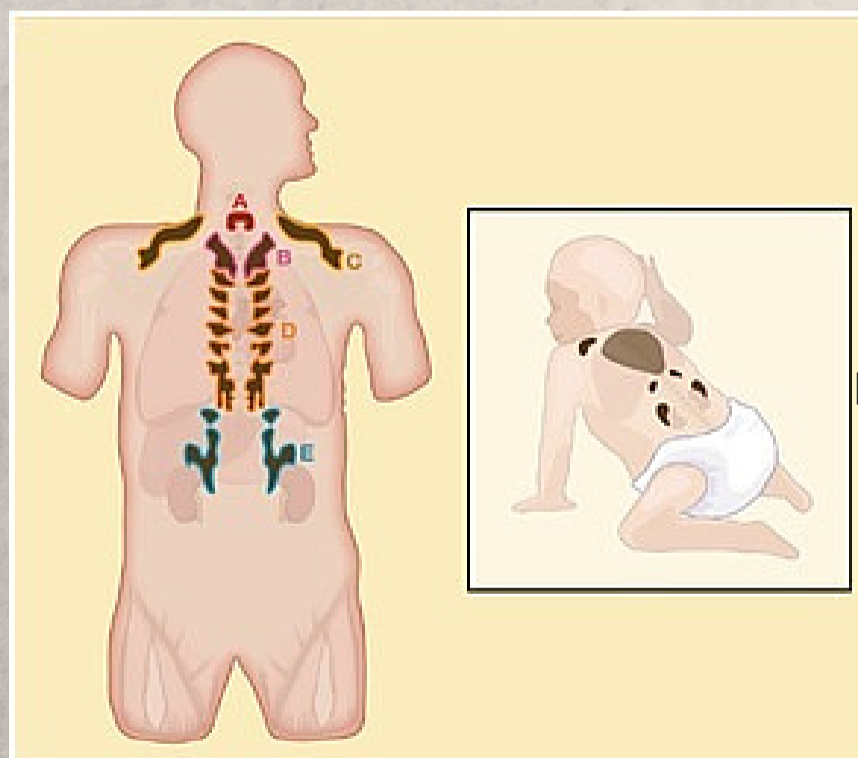


Figure 2. BAT distribution in adults and newborns. Extracted from : Enerbäck S. 2010., 11; (248-252)

3. Physiological regulation

- Exposure to cold
- Thyroid hormones
- Physical exercrise
- Diet

4. Beige/brite adipose tissue

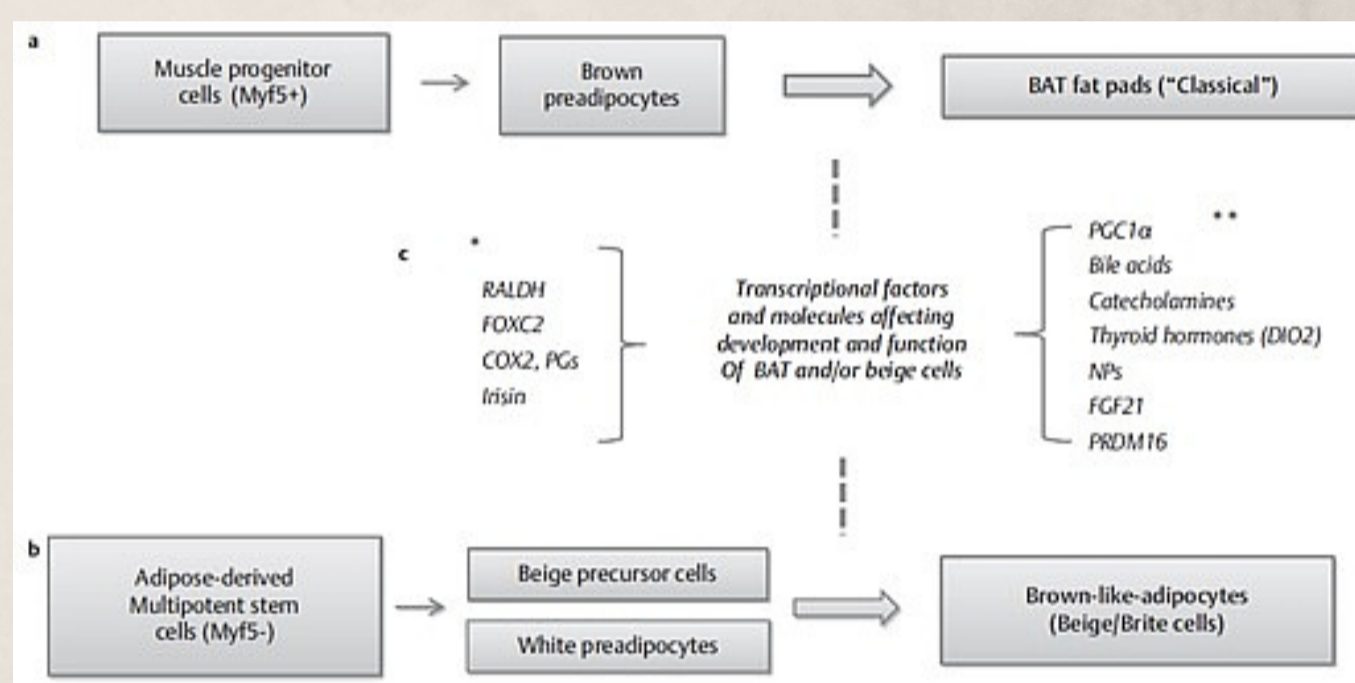


Figure 3. Recruitment and differentiation of adipose tissue. Extracted from: Zafrir B. 2013.. Horm Metab Res., 45: (774-785)

5. BAT associated with obesity

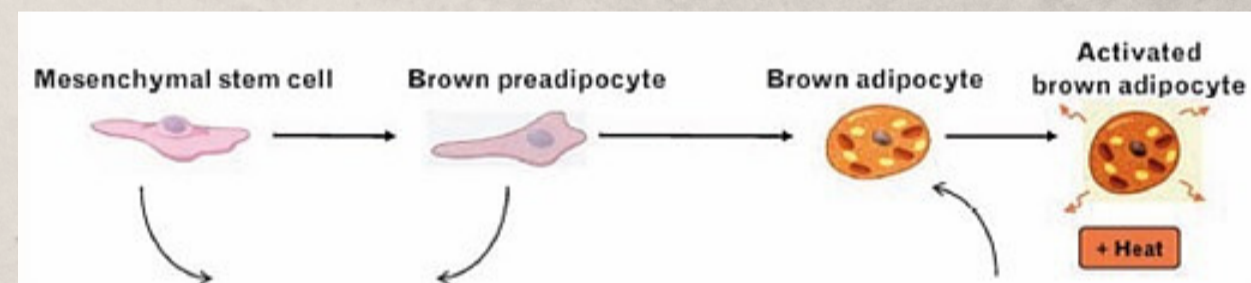


Figure 4. Development of funcnional brown adipocyte. Extracted from: Cypess AM. and Kahn CR. 2010. Curr Opin Endocrinol Diabetes Obes, 17(2): (143-149).

Two approaches:

- In - vivo: pharmaceutical approach
- Ex-vivo: cell based approach

CONCLUSIONS

- Existence of BAT in humans.
- BAT regulated by adrenergic stimulation and cold.
- Discovery of beige adipose tissue.
- In-vivo and ex-vivo technical aproches could be a future solution to the obesity problem.
- Further research is needed.