



中华医学会核医学分会
技术与继续教育学组

中华医学会核医学分会第十一届委员会 技术与继续教育学组

PET/CT质控病例分析

专家姓名：郑山

专家单位：福建医科大学附属第一医院

临床病史：

- 女性，24岁，反复发热2月余
- 实验室检查无特殊
- 临床考虑成人Still病可能
- 为排除肿瘤行PET/CT检查

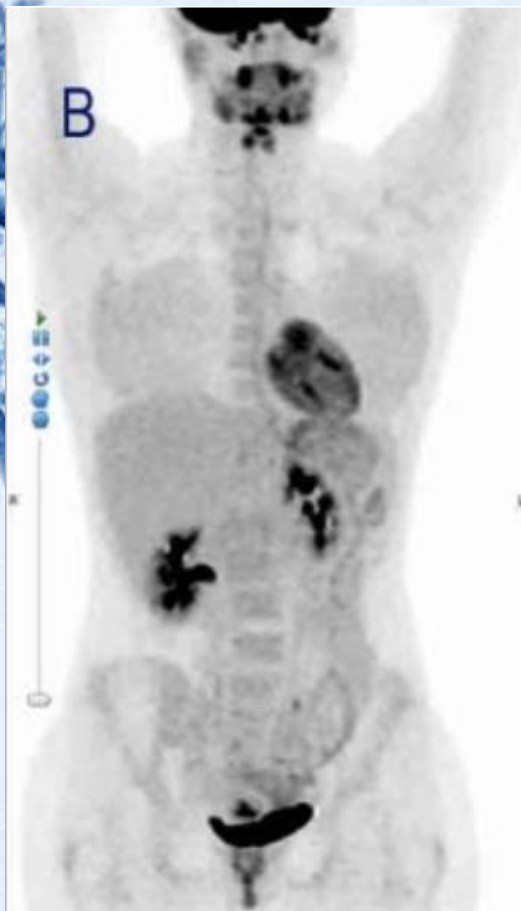


- 2016.01.24 PET/CT检查:
 - 身高162cm, 体重49kg
 - 空腹血糖5.3mmol/L
 - 空腹状态下注射 ^{18}F -FDG 5.2mCi (9am)
 - 注射后52min行PET/CT显像



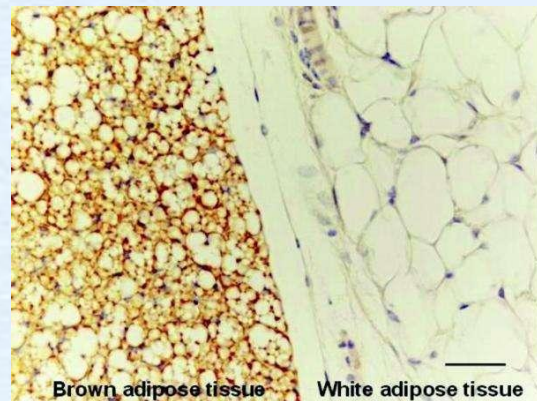
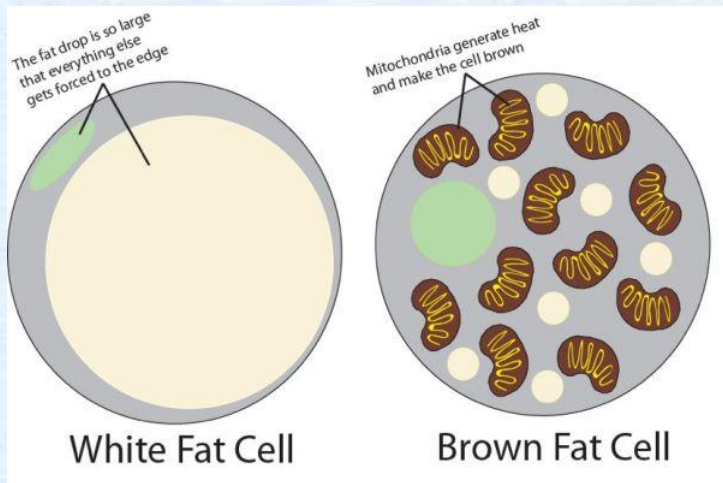


A large, stylized comic book speech bubble is centered on the page. The bubble has a jagged, starburst-like border and a red background with a white halftone dot pattern. The word "WHAT?" is written in large, bold, white, sans-serif capital letters with a thick black outline, filling most of the bubble.



- 2016.01.26 再次PET/CT检查：
 - 嘱患者多穿衣物
 - 空腹血糖5.6mmol/L
 - 空腹状态下注射 ^{18}F -FDG 5.1mCi (10am)
 - 注射后62min行PET/CT显像 (候诊室暖气打开)



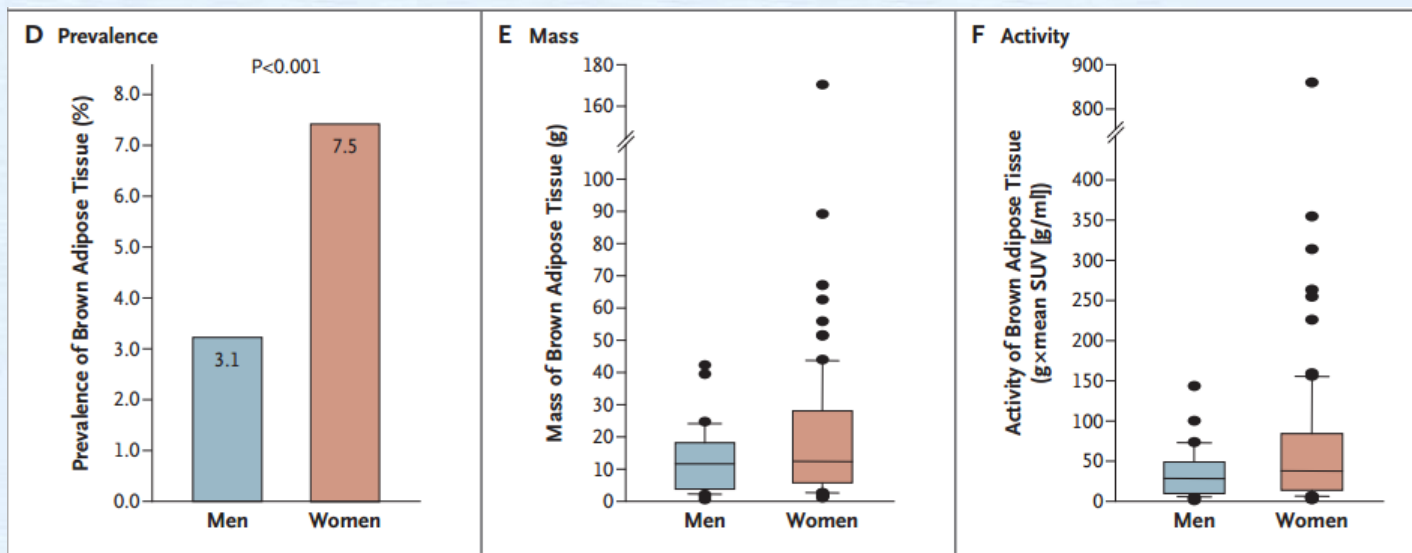


棕色脂肪：因富含线粒体固呈棕色，常见于双侧颈部、锁骨上区和脊柱旁，腋窝、纵隔及腹部也可见到

影响棕色脂肪摄取的主要因素：

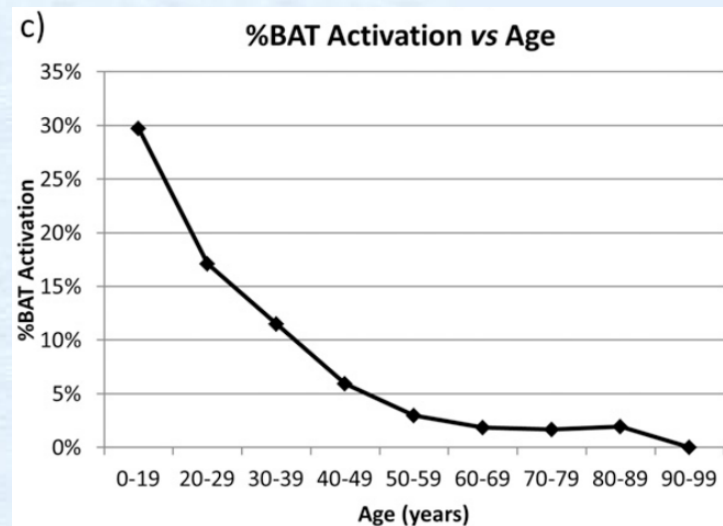
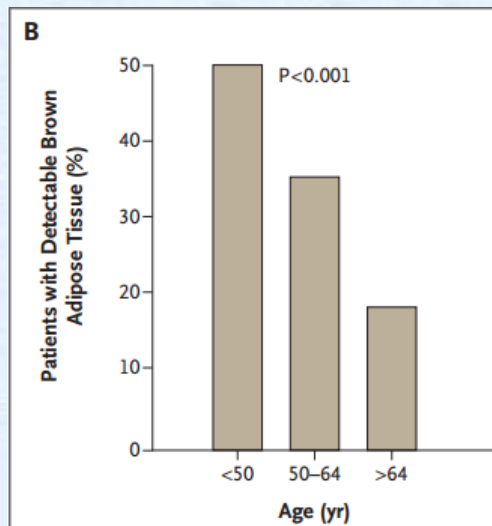
- 性别
- 年龄
- 体重
- 环境温度（寒冷刺激）
- 进食（血糖水平）
- 注射时间

性别的影响



Cypess, A. M., Lehman, S., Williams, G., Tal, I., Rodman, D., Goldfine, A. B., ... Kahn, C. R. (2009). Identification and Importance of Brown Adipose Tissue in Adult Humans. *New England Journal of Medicine*, 360(15), 1509–1517. doi:10.1056/nejmoa0810780

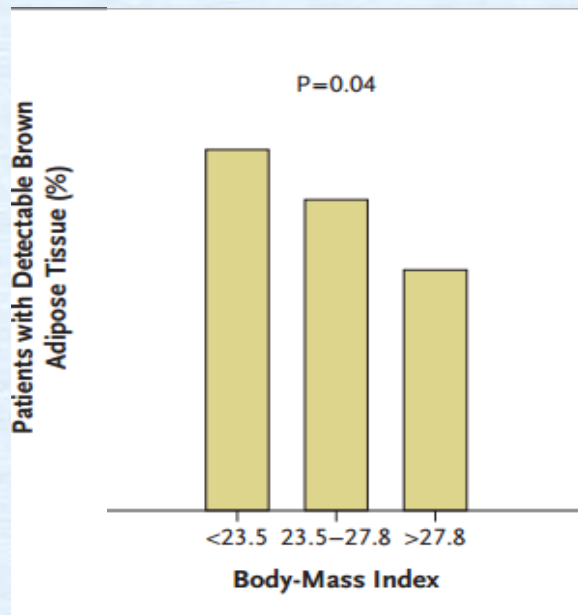
年龄的影响



Cypess, A. M., Lehman, S., Williams, G., Tal, I., Rodman, D., Goldfine, A. B., ... Kahn, C. R. (2009). Identification and Importance of Brown Adipose Tissue in Adult Humans. *New England Journal of Medicine*, 360(15), 1509–1517. doi:10.1056/nejmoa0810780

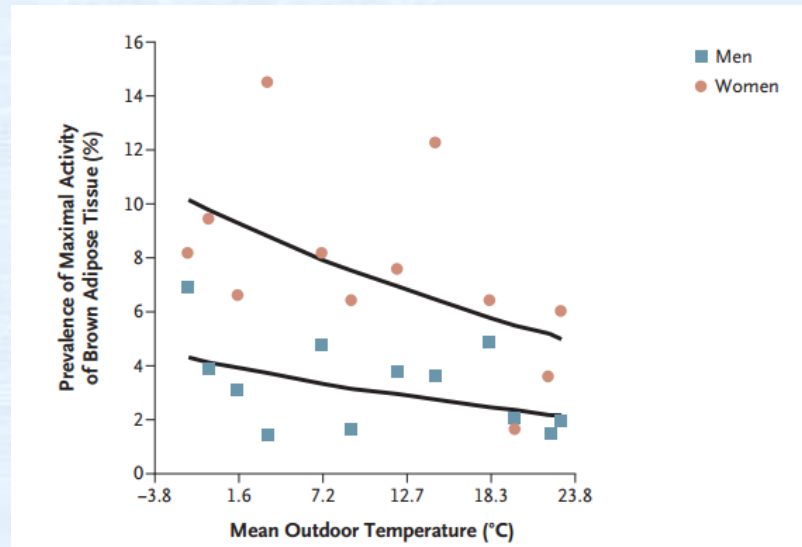
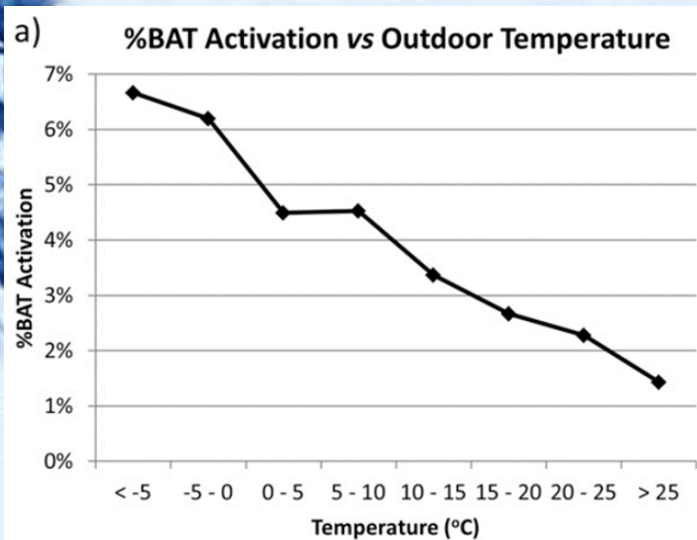
Steinberg JD, Vogel W, Vegt E. Factors influencing brown fat activation in FDG PET/CT: a retrospective analysis of 15,0001 cases. *Br J Radiol* 2017; 90: 20170093.

体重的影响



Cypess, A. M., Lehman, S., Williams, G., Tal, I., Rodman, D., Goldfine, A. B., ... Kahn, C. R. (2009). Identification and Importance of Brown Adipose Tissue in Adult Humans. *New England Journal of Medicine*, 360(15), 1509–1517. doi:10.1056/nejmoa0810780

环境温度的影响



Cypess, A. M., Lehman, S., Williams, G., Tal, I., Rodman, D., Goldfine, A. B., ... Kahn, C. R. (2009). Identification and Importance of Brown Adipose Tissue in Adult Humans. *New England Journal of Medicine*, 360(15), 1509–1517. doi:10.1056/nejmoa0810780

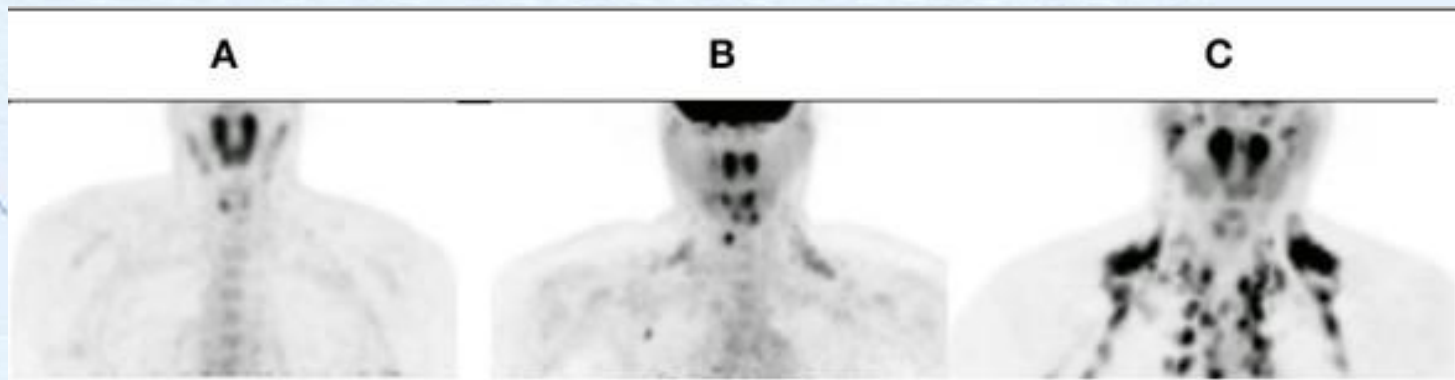
Steinberg JD, Vogel W, Vegt E. Factors influencing brown fat activation in FDG PET/CT: a retrospective analysis of 15,0001 cases. *Br J Radiol* 2017; 90: 20170093.

不同程度的寒冷刺激对棕色脂肪摄取的影响

16°C, 10min

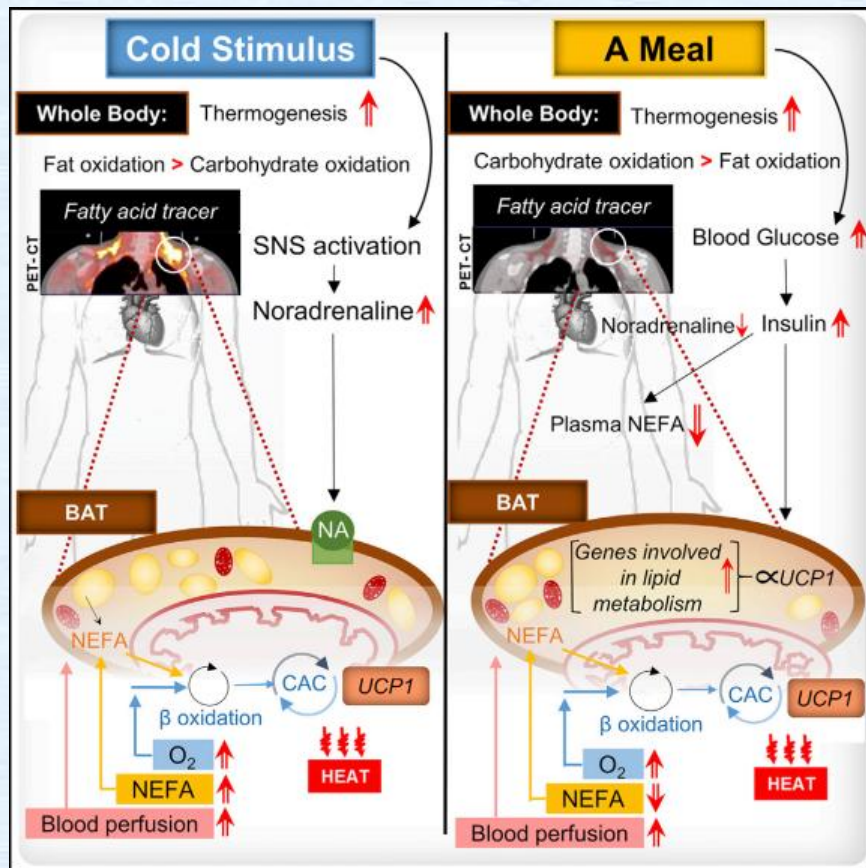
5°C,
10min

3.8°C,
45min



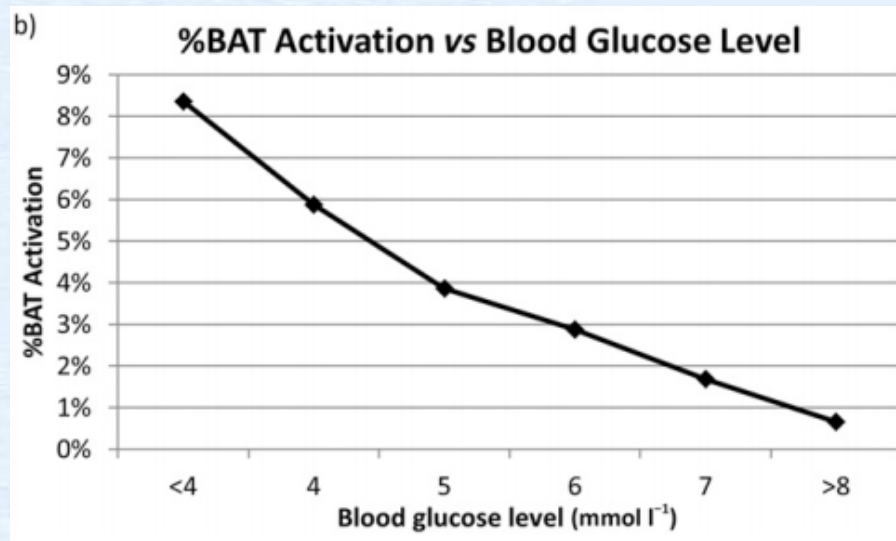
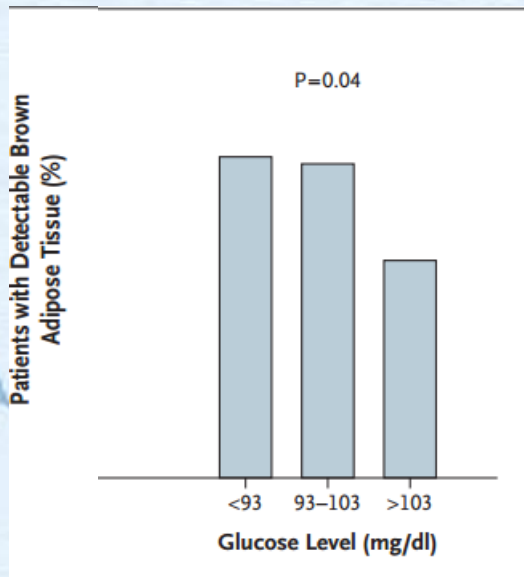
Martinez-Tellez B, Sanchez-Delgado G, Garcia-Rivero Y, Alcantara JMA, Martinez-Avila WD, Muñoz-Hernandez MV, Olza J, Boon MR, Rensen PCN, Llamas-Elvira JM and Ruiz JR (2017) A New Personalized Cooling Protocol to Activate Brown Adipose Tissue in Young Adults. *Front. Physiol.* 8:863. doi: 10.3389/fphys.2017.00863

寒冷刺激和进食
状态下棕色脂肪
的动员



U Din et al., Postprandial Oxidative Metabolism of Human Brown Fat Indicates Thermogenesis, Cell Metabolism (2018), <https://doi.org/10.1016/j.cmet.2018.05.020>

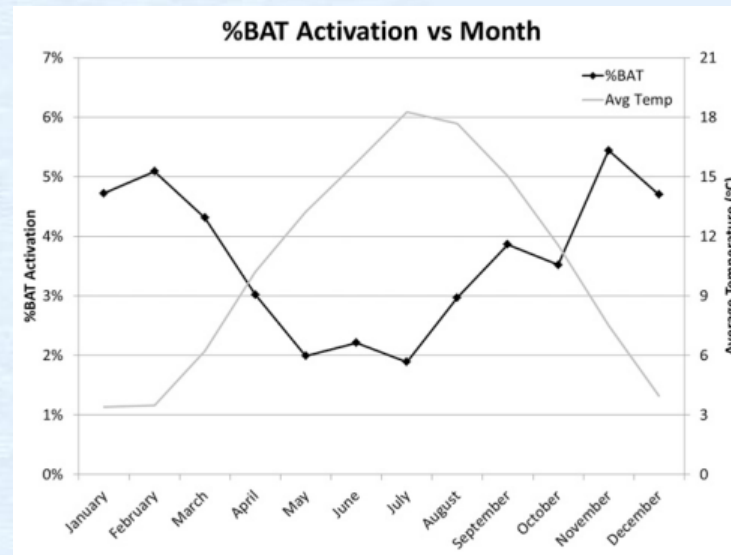
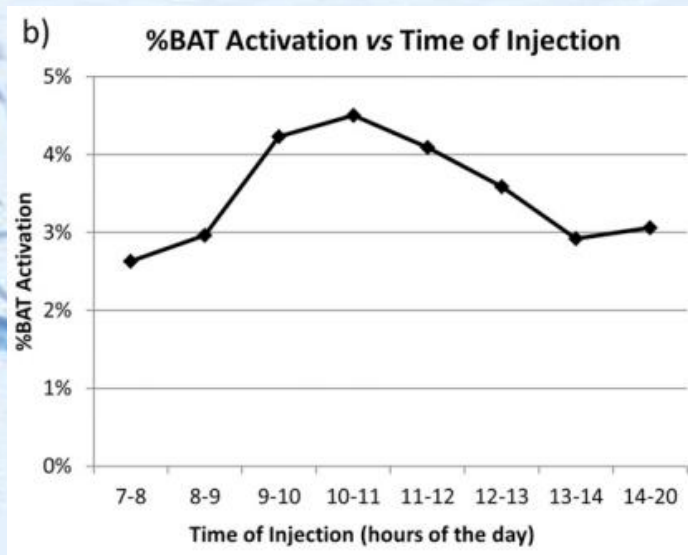
进食（血糖）的影响



Cypess, A. M., Lehman, S., Williams, G., Tal, I., Rodman, D., Goldfine, A. B., ... Kahn, C. R. (2009). Identification and Importance of Brown Adipose Tissue in Adult Humans. *New England Journal of Medicine*, 360(15), 1509–1517. doi:10.1056/nejmoa0810780

Steinberg JD, Vogel W, Vegt E. Factors influencing brown fat activation in FDG PET/CT: a retrospective analysis of 15,0001 cases. *Br J Radiol* 2017; 90: 20170093.

注射时间的影响



Steinberg JD, Vogel W, Vegt E. Factors influencing brown fat activation in FDG PET/CT: a retrospective analysis of 15,0001 cases. Br J Radiol 2017; 90: 20170093.

影响棕色脂肪摄取的其他一些可能因素：

- 激素（甲状腺激素、糖皮质激素和心脏分泌的一些激素）
- 某些药物（辣椒碱、安定、心得安）
- 运动
- 某些细胞因子（成纤维细胞生长因子21）



Thank you for your attention!

感谢关注！我们砥砺前行！



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技术与继续教育学组

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