

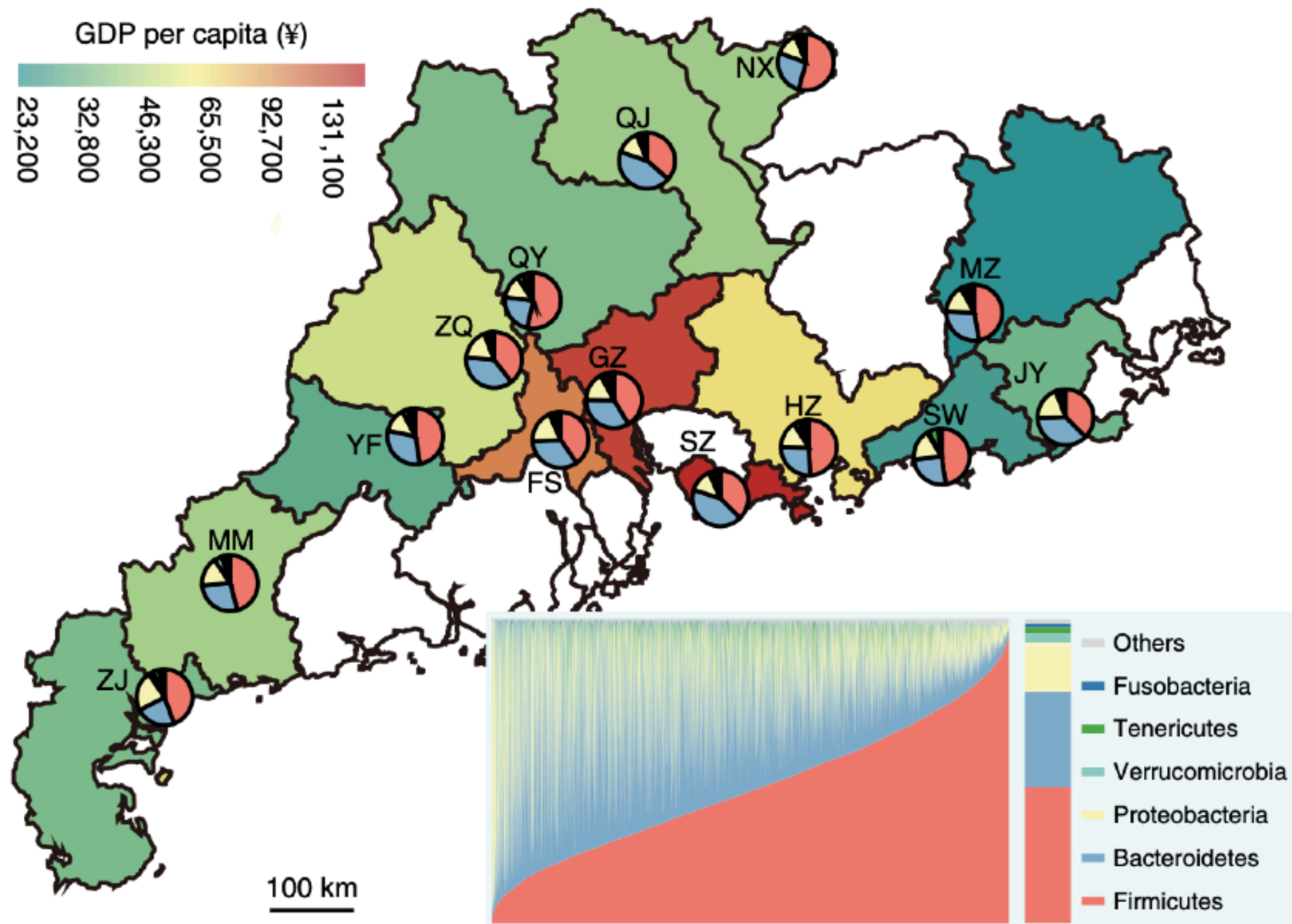
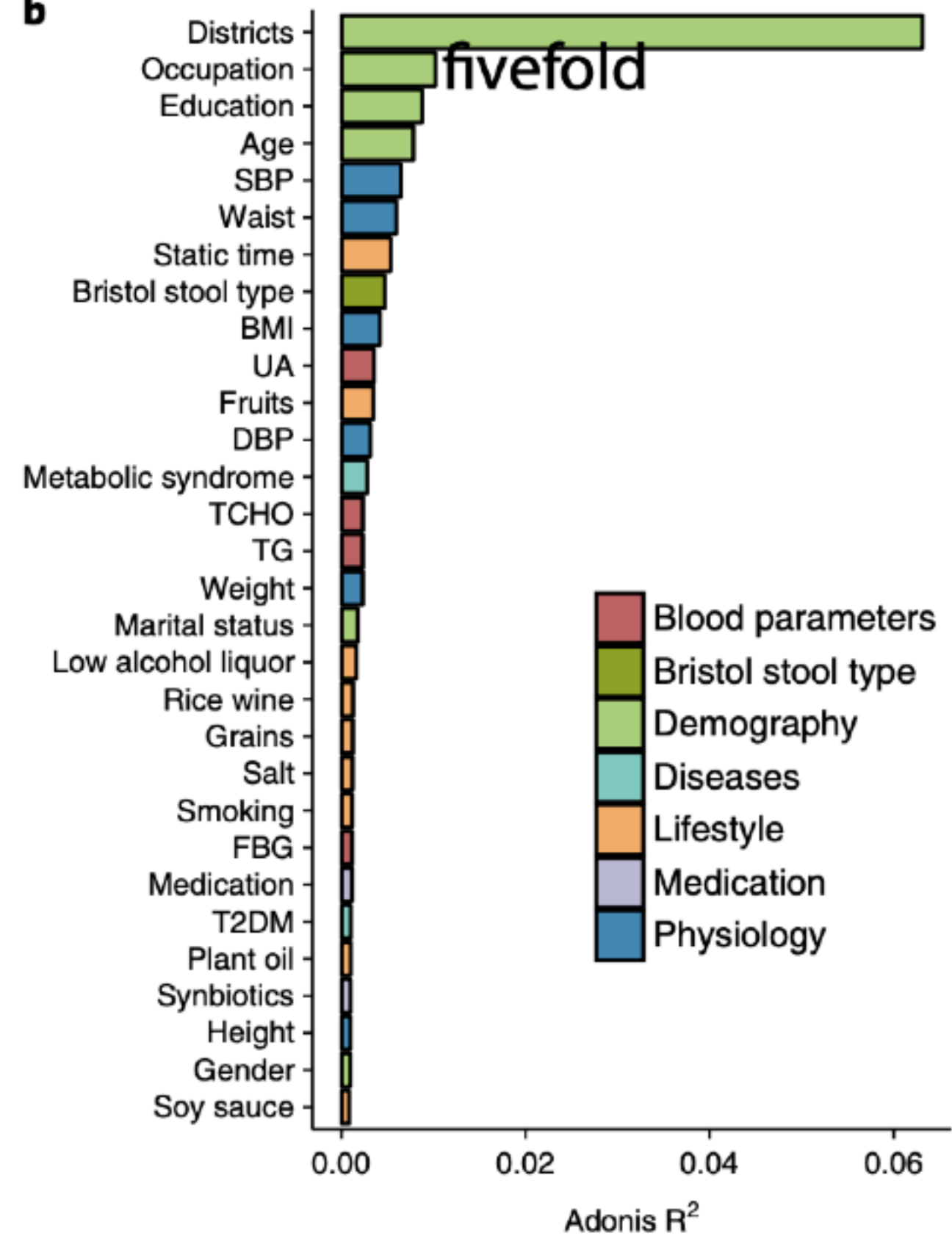


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Limitação

**a****b**

# Regional variation limits applications of healthy gut microbiome reference ranges and disease models

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In conclusion, our data reinforce the need to use consistent sampling protocols to build localized reference baselines for gut microbiota. The applicability of disease models in new populations must be explicitly tested rather than assumed. The populations used to generate healthy reference data and train disease models must therefore be clearly stated when performing gut microbiome analyses, especially when intended for clinical use.



## LETTERS

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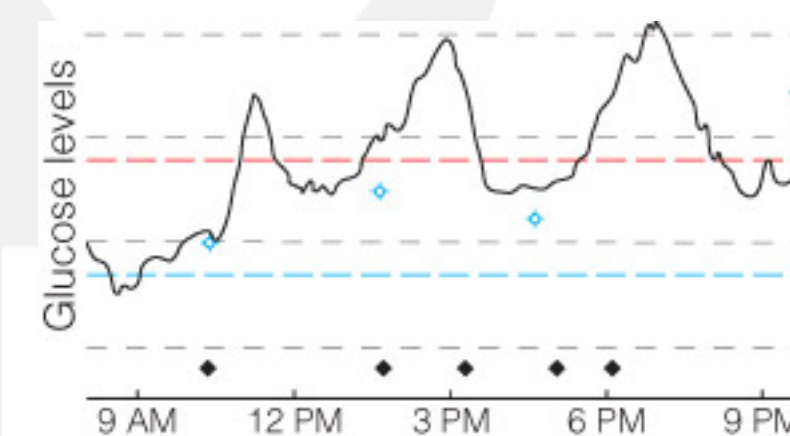
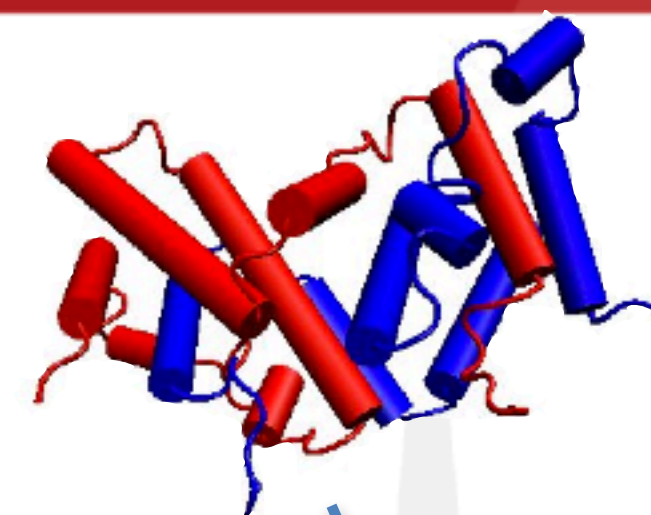
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# Observar e criar hipótese

- IFN-gamma atrapalha o metabolismo de glicose.
- Diabetes tipo 2 é um desequilíbrio no metabolismo.
- Akkermansia muciniphila associada à diabetes.
- Inflamação associada à diabetes.

*"Chronic inflammation impairs metabolic homeostasis and is intimately correlated with the pathogenesis of type 2 diabetes. The pro-inflammatory cytokine IFN-gamma is an integral part of the metabolic inflammation circuit and contributes significantly to metabolic dysfunction. The underlying mechanism, however, remains largely unknown."*



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## Interferon gamma (IFN- $\gamma$ ) disrupts energy expenditure and metabolic homeostasis by suppressing SIRT1 transcription

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