



UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvenoot • your knowledge partner

Immune-endocrine Interactions in Type 2 Diabetes During Latent and Active TB

Katharina Ronacher

Associate Professor

Stellenbosch University Immunology Research Group (SUN-IRG), Division of Molecular Biology and Human Genetics, Faculty of Health Sciences, Stellenbosch University, South Africa.



Departement Gesondheidswetenskappe

Faculty of Health Sciences



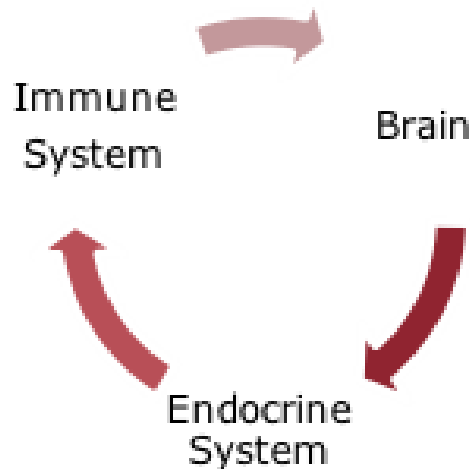


The link between the immune and endocrine system



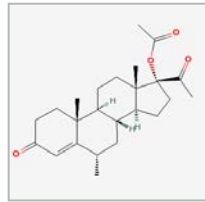
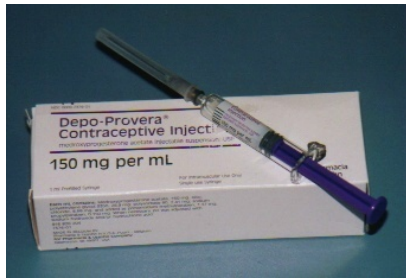
- Hormone receptors are expressed on immune cells
- Structural similarity between cytokine and hormone receptors
- Hormones are produced by cells of the immune system

ACTH is produced by lymphocytes and binding of CRH to lymphocytes stimulates ACTH production.

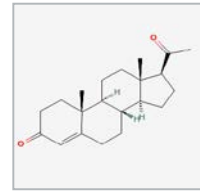




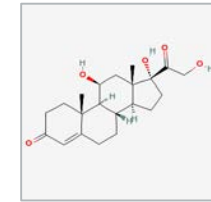
Hormones can affect immune function



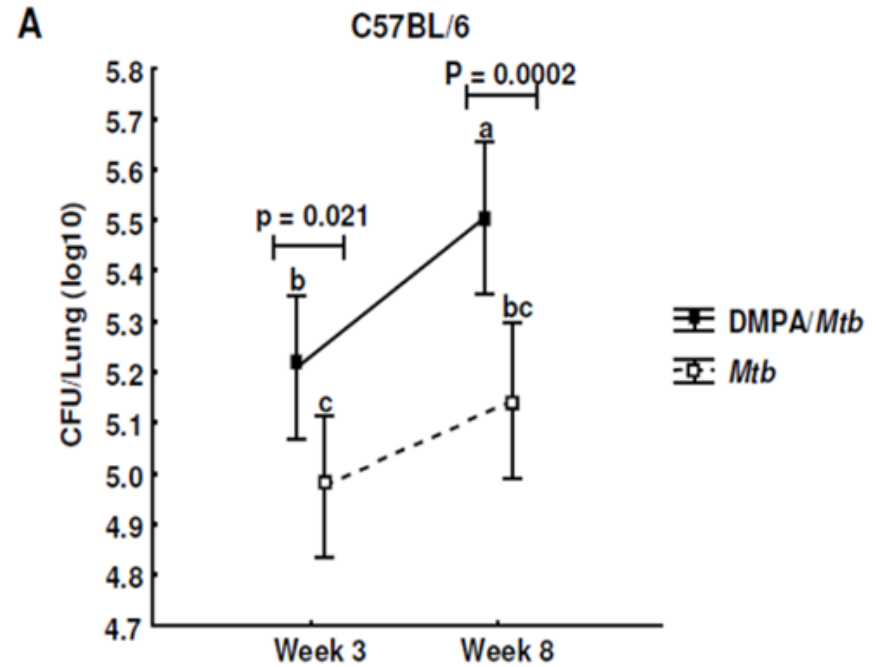
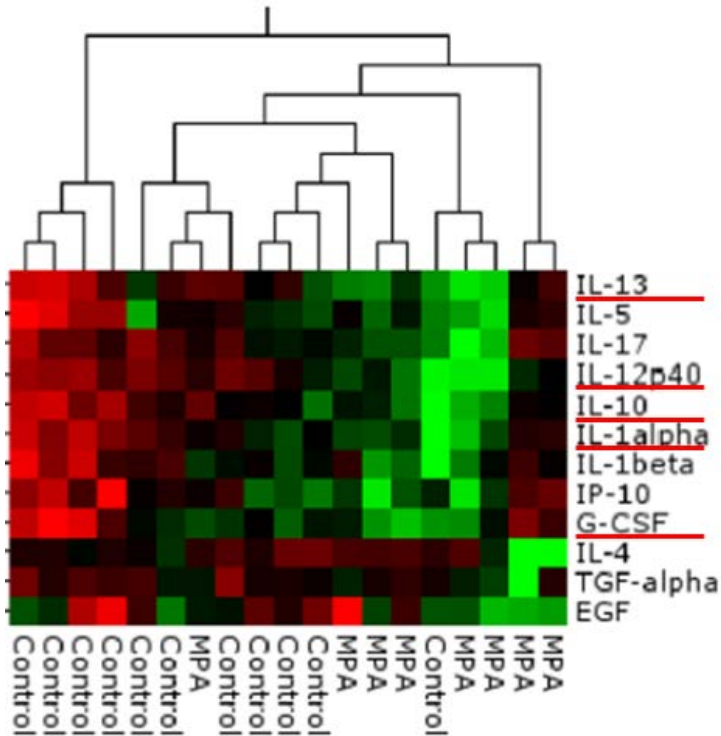
MPA



Progesterone

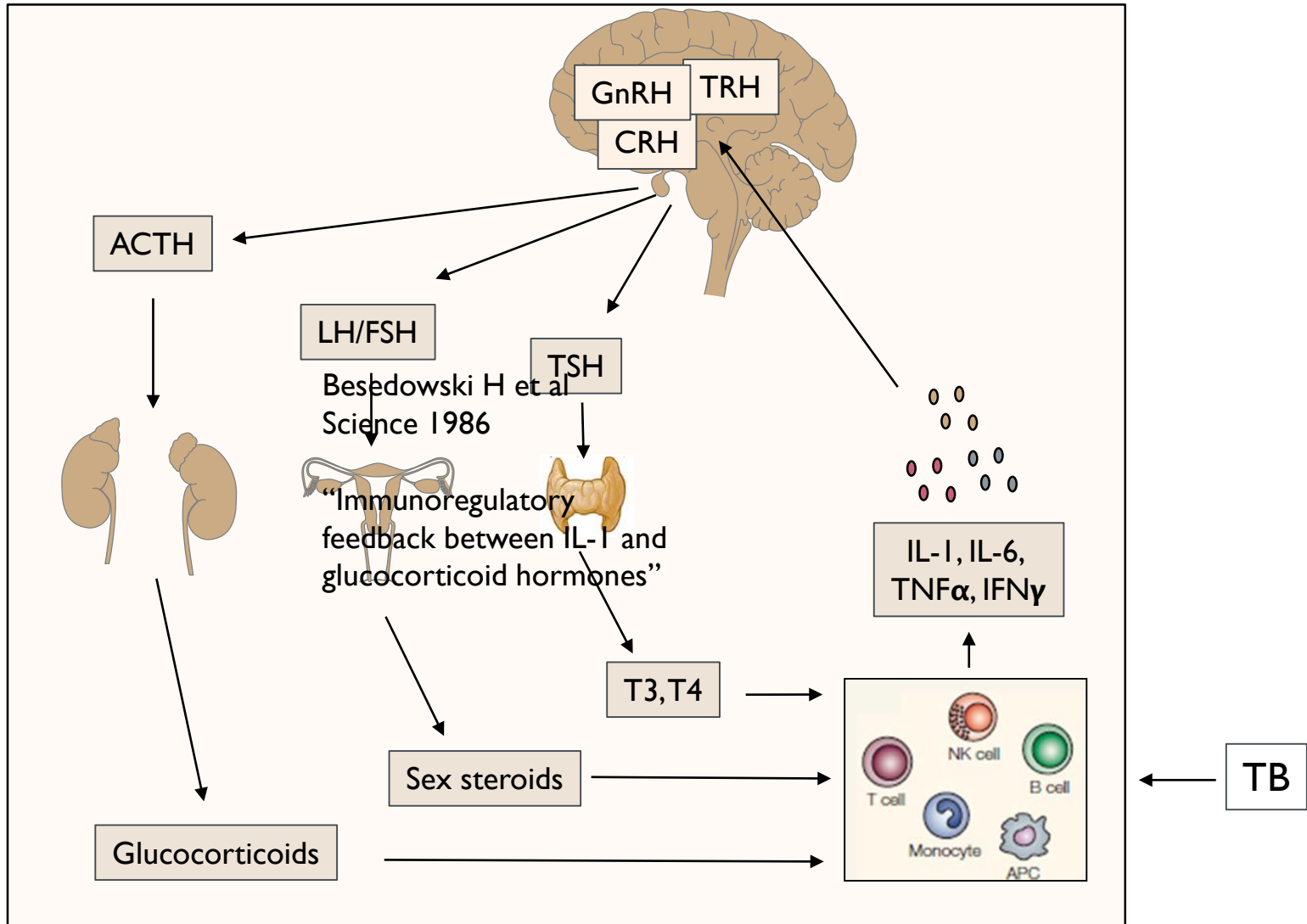


Cortisol



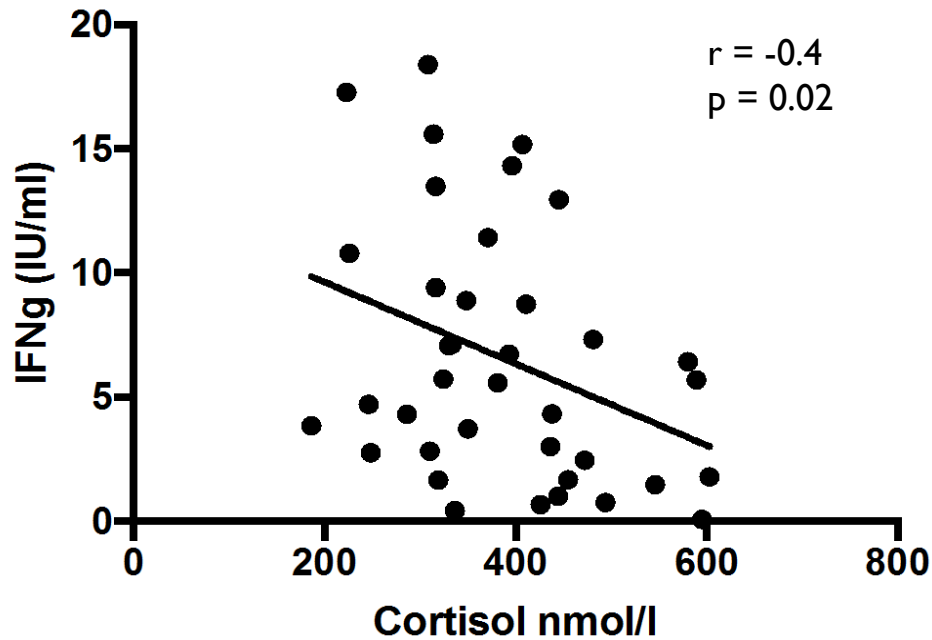


How can TB infection/disease affect the endocrine system?





IFN_γ secretion negatively correlates with serum cortisol concentrations in LTBI





Endocrine changes during active TB and TB treatment

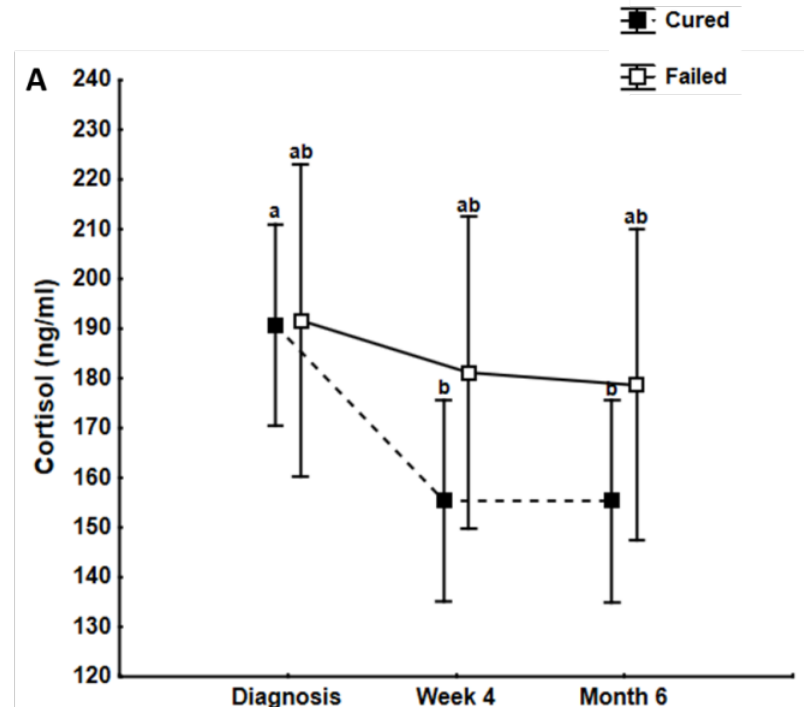
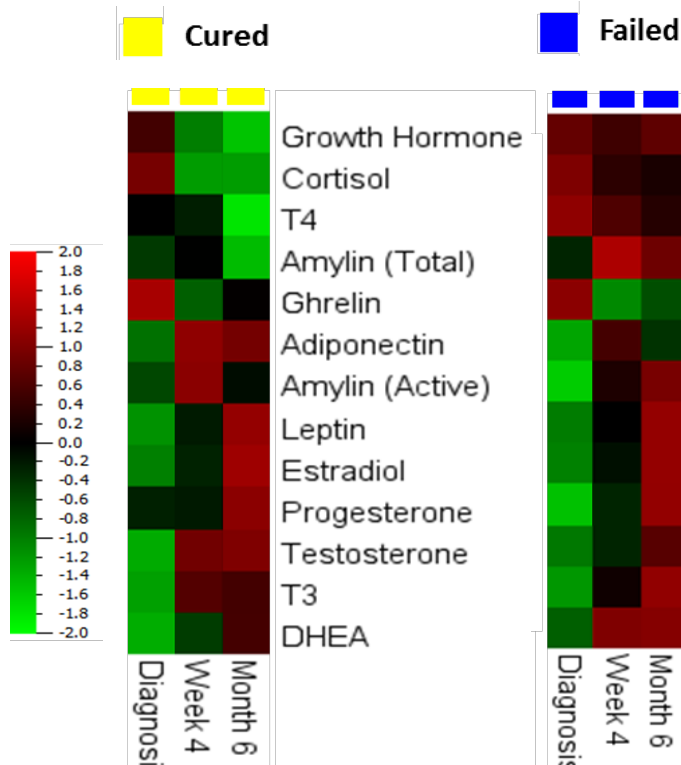


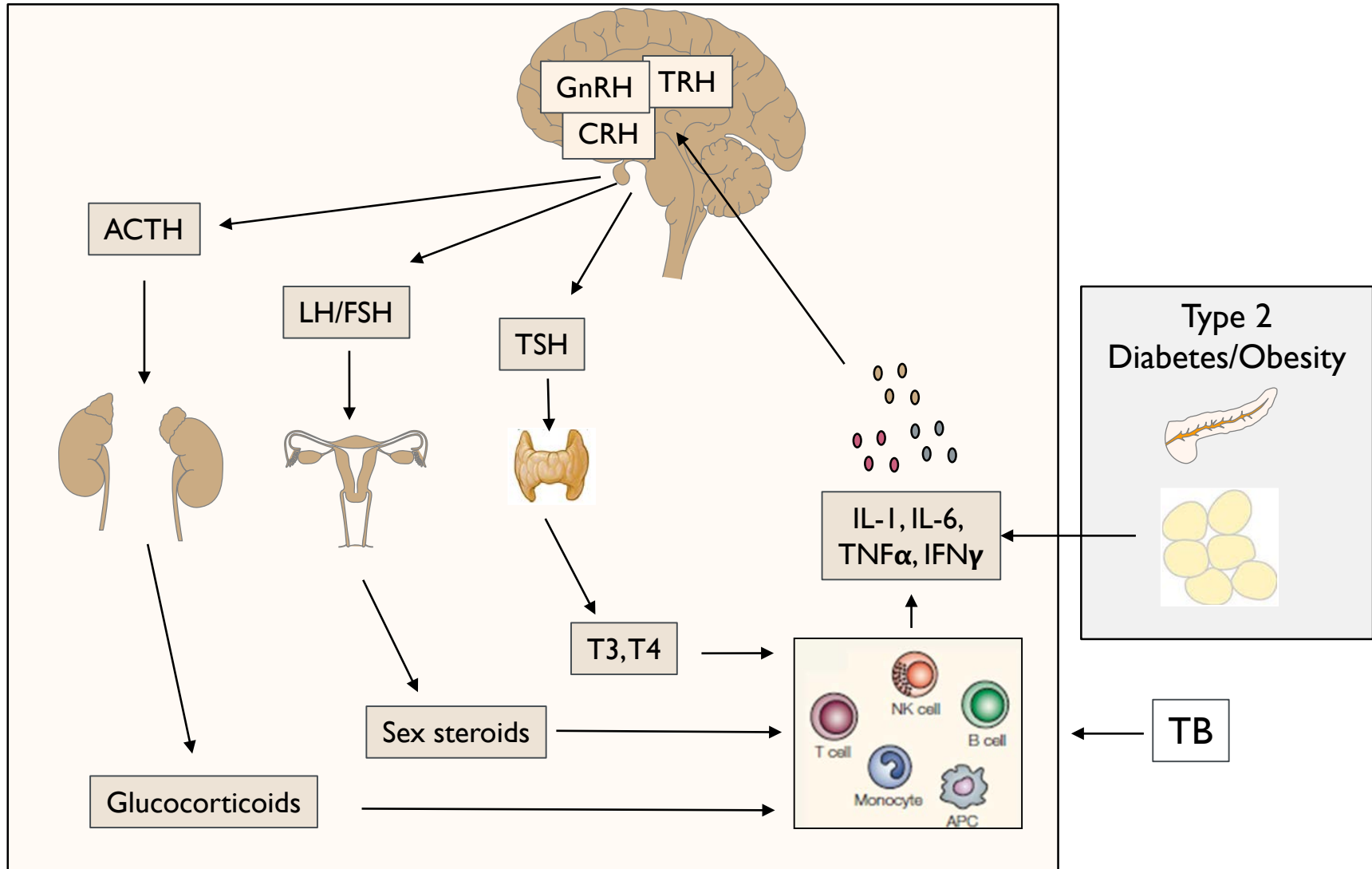
Table 1: Characteristics of study groups.

	Cured (n = 27)	Failed (n = 10)	p-value
Age (years)*	35.0 ± 10.42	38.6 ± 11.9	0.44
Sex (F/M)	14/13	5/5	
BMI (kg/m²)*	18.1 ± 0.4	18.8 ± 0.7	0.33
CXR score*	57.6 ± 6.3	71.7 ± 11.3	0.31

*Results are shown as mean ± SD. F: female, M: male, BMI: body mass index, CXR: chest X-ray

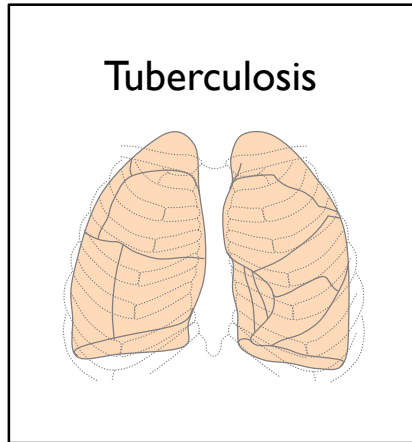


Can chronic inflammation influence the HP axis?

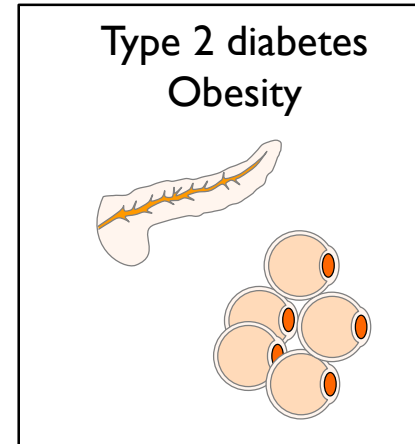
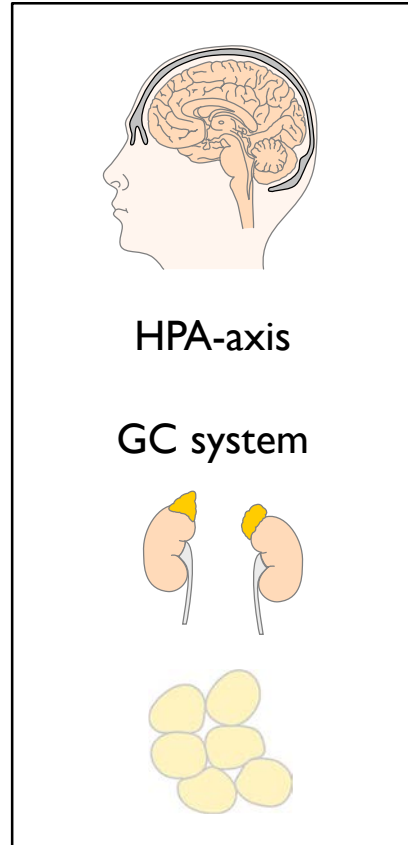




TB and Diabetes lead to changes in the GC system



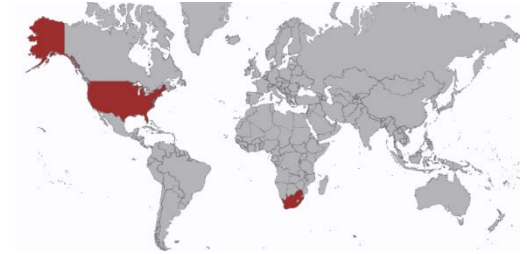
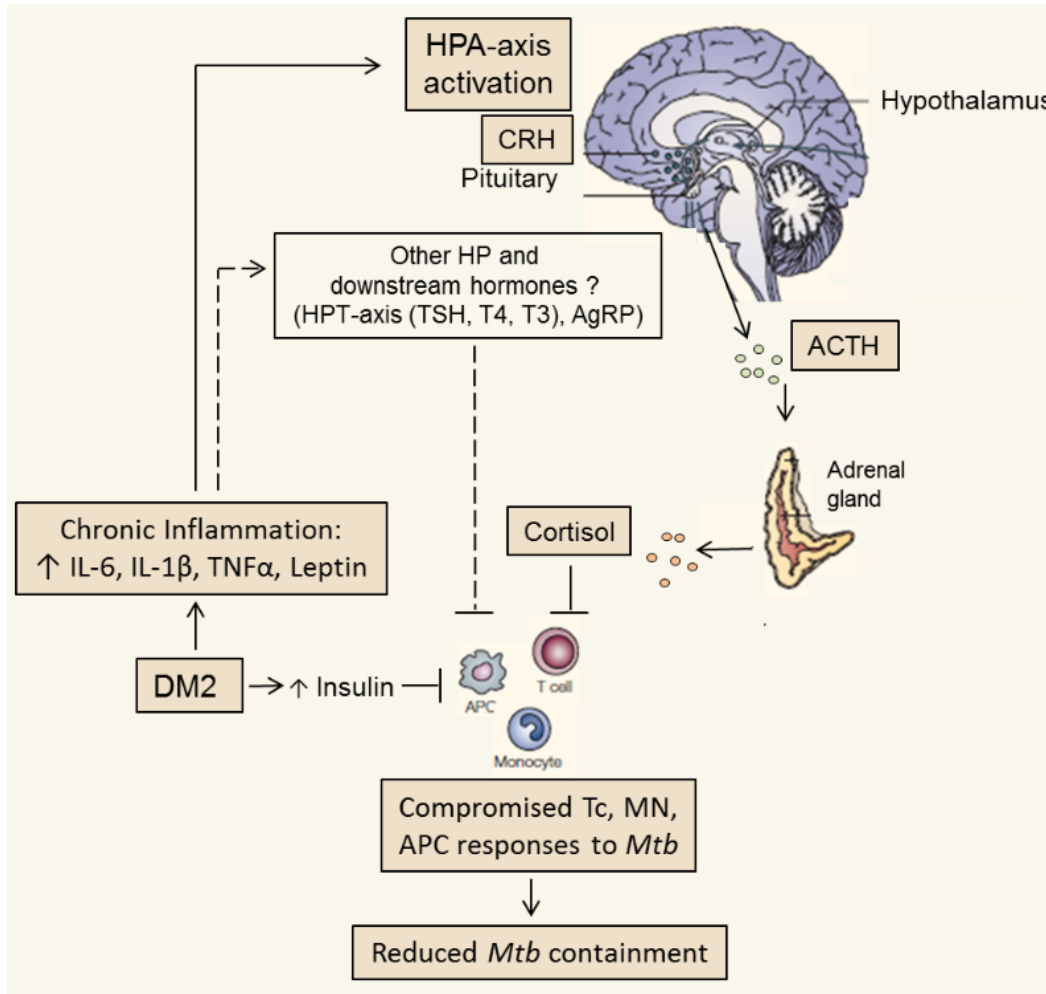
- ↑ cortisol
- ↑ transient hyperglycaemia
- ↑ GR β – GC resistance



- ↑ cortisol HPA (?)
- ↑ cortisol periphery (11 β -HSD I)
- ↑ GR β – GC resistance



Altered Endocrine Axis in Type 2 Diabetes and Risk for Tuberculosis



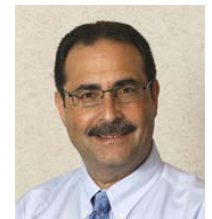
Katharina Ronacher
Stellenbosch University



Blanca Restrepo
University of Texas



Gerhard Walz
Stellenbosch University



Larry Schlesinger
Ohio State University



- Interdisciplinary approach to fight the TB-T2DM co-epidemic
 - ▶ TB is more than an infectious lung disease
 - ▶ T2DM is a complex disorder

- New therapeutic opportunities, host directed therapies
 - ▶ DHEA derivatives



Acknowledgements



My team:



Leanie Kleynhans
(Senior Researcher)



Carine Kunsevi-Kilola
(PhD student)



Happy Tshivhula
(PhD student)



Jessica Klazen
(MSc student)



Mosa Selamolela
(MSc student)



Nicole Prins
(Research Assistant)



Ayanda Shabangu
(BSc honours student)

SUN Immunology Research Group

Gerhard Walzl

Clinical and staff and all other SUN-IRG members

Collaborators (TB-DM related studies)

TANDEM

Hazel Dockrell, London School of Hygiene and Tropical Medicine

Reinout van Crevel, Radboud University Medical Center

Julia Critchely, St. George's University, London

ALERT

Blanca Restrepo, University of Texas

Larry Schlesinger, Ohio State University

Magda Conradie, Stellenbosch University

Funders



National
Research
Foundation

