

# Type 1 Diabetes Onset: a story of innate and adaptive immune cells?

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## INTRODUCTION

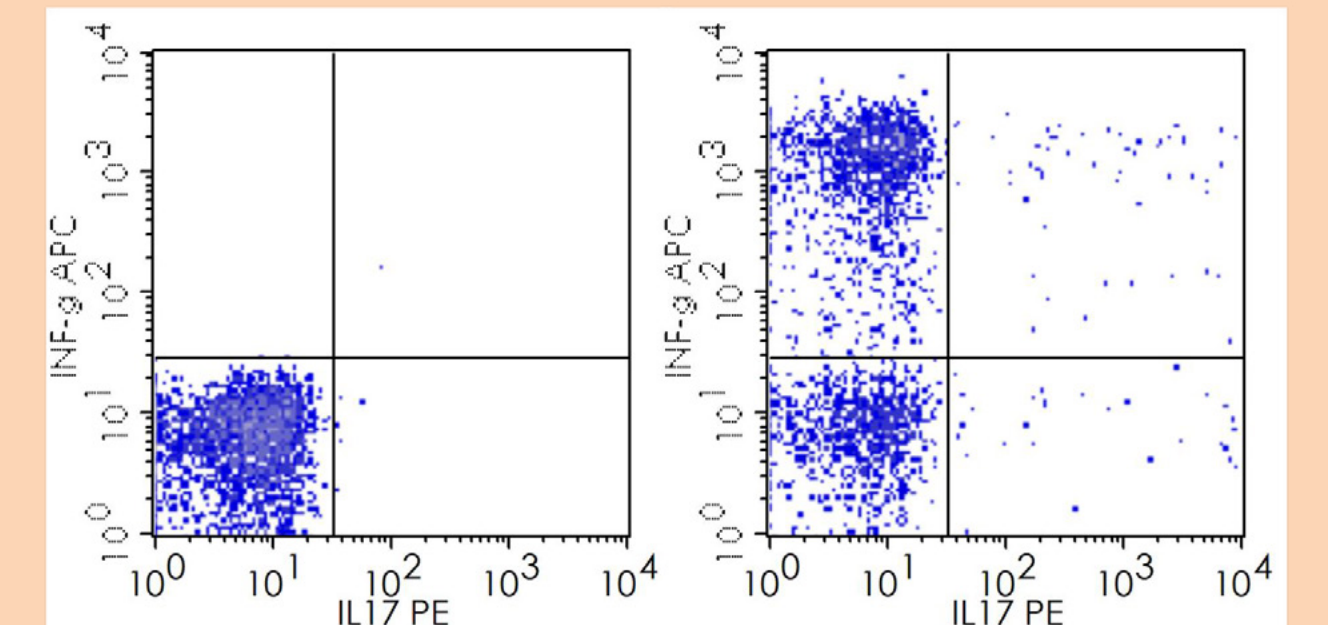
- Type 1 diabetes (T1D) is a T cell-mediated autoimmune disease.
- A more complex immunological picture is being unraveled, with a key role of innate immune cells at disease onset and maintenance.
- For new therapies based on immune-modulation to be possible, immune characterization of T1D patients is crucial.

## OBJECTIVE

- To characterize innate and adaptive immune cells of T1D children at a well-defined “onset-window” of disease, and to correlate with the metabolic status of patients at this stage.

## MATERIALS AND METHODS

- N = 41 T1D children
- New-onset T1D: <14 days after diagnosis
- Pediatric central hospital
- Blood samples from patients and matched controls were evaluated by flow cytometry.
- HbA1c was also evaluated by HPLC at the same time point in T1D.
- Statistical significance was defined by a P-value of <0.05



## RESULTS

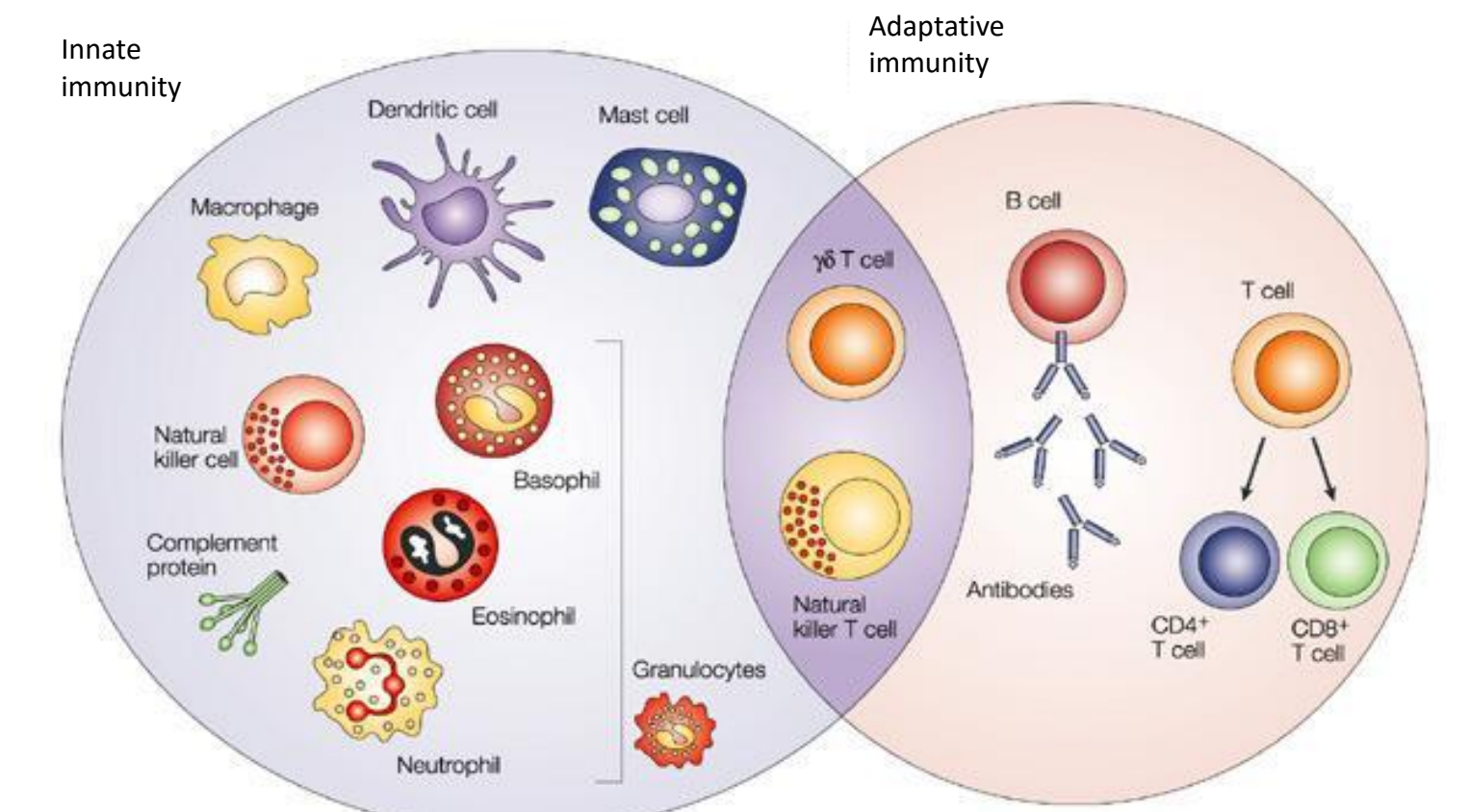
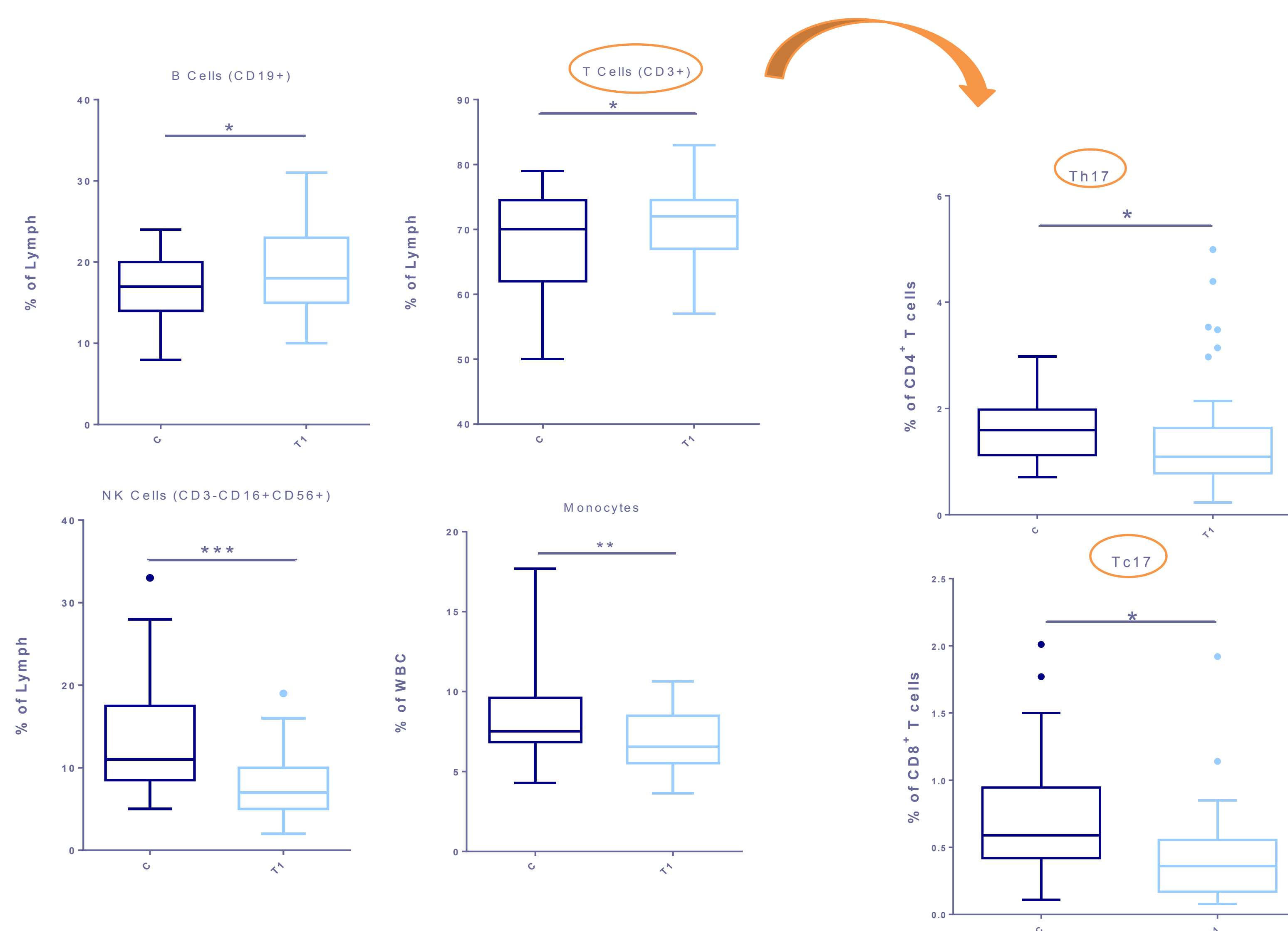
N=41

Age: 9 ± 3 (mean±sd), 1-16 y  
20/41 males

### Characterization at disease onset

Children with T1D presented significantly different immune cell populations profile, compared to controls:

- higher T and B cell percentages;
- within T cells, decreased Th17 and Tc17 cells;
- lower NK cells;
- Lower monocytes.



All graphs:  
C – controls  
T1 – disease onset

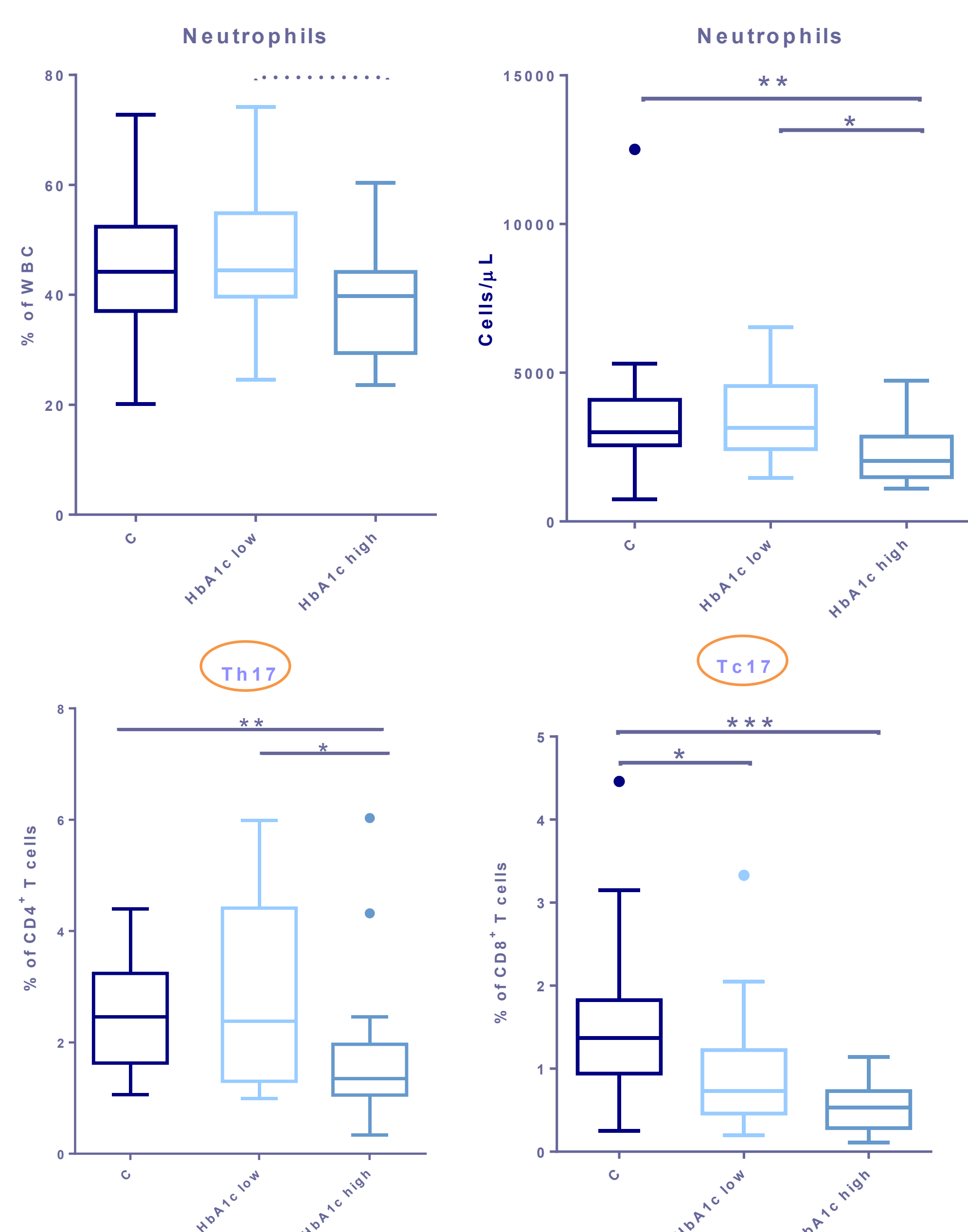
\* p<0,05  
\*\* p<0,01  
\*\*\* p<0,001

### Relation to HbA1C

Low HbA1C <12% | High HbA1C ≥12%

compared to low-HbA1c and controls, significantly **reduced** peripheral blood

- **neutrophils**
- **Th17 and Tc17**



## CONCLUSIONS

- Both **innate and adaptive** immunity are involved in T1D pathogenesis
- The **lower circulating** innate cells (NK cells, monocytes) and IL17-producing cells may reflect increased migration of these cells to pancreatic tissue at this stage.
- **Longer and more severe pre-clinical hyperglycemic patients** might be the ones with **more severe insulinitis** at disease onset (with more intense migration of inflammatory cells from the periphery)
- Moreover, **glucotoxicity** effect on innate and adaptive immunity cannot be overlooked.
- The **similar pattern of Th17 and neutrophils** profile confirm the intimate relation of these cell populations in organ specific inflammatory processes
- Our data point toward a **relevant role of neutrophils and IL17-producing cells** as part of future strategies in immune modulation.
- **In vivo imaging techniques** emerge as a key tool to integrate peripheral findings and pancreatic inflammation.

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