Assessing donor Anellovirus transmission and persistence in pediatric kidney transplant recipients.

Klomp, L.S.[1], Burggraaff, M.G.J.M[2,3], Bakker, M.[2,3], Molier, M.[4], Feltkamp, M.C.W.[4,5], Van der Hoek, L.[2,3] and Bouts, A.H.M.[1,2].

1. Amsterdam University Medical Centers, University of Amsterdam, Emma Children's Hospital, Department of Pediatric Nephrology, Amsterdam, the Netherlands. Department of Pediatric Nephrology, Emma Children's Hospital, Amsterdam UMC, University of Amsterdam, The Netherlands;
2. Department of Infectious Diseases, Amsterdam Institute for Infection and Immunity, Amsterdam, The Netherlands;
3. Department of Medical Microbiology and Infection Prevention, Laboratory of Experimental Virology, Amsterdam UMC, University of Amsterdam, Amsterdam, The Netherlands;
4. Blood-borne Infections Research, Department of Research & LabServices, Sanquin Blood Supply, Amsterdam, The Netherlands;
5. Department of Medical Microbiology & Infection Prevention, Leiden University Center of Infectious Diseases, Leiden University Medical Center, Leiden, The Netherlands.

Background

- Balancing rejection, infection, PTLD prevention and drug toxicity remains difficult in pediatric kidney transplantation.
- Plasma drug levels only fail to reflect individual immune status
- Better tools are required to assess individual immune function.
- *Alphatorquevirus* (TTV) is a marker of immune activity in kidney transplant recipients
- High TTV loads indicate reduced immune activity

Primary objective

To assess changes of the anellome in children post-transplantation,

Hypothesis

1. That anelloviruses will be introduced with the donor kidney
2. That donor anelloviruses colonize and persist in the recipient.

Methods

N = 6 living-unreleated donor-recipient pairs.

Recipients → 2 years post transplantation,
Donors → just before donation.

- **Samples source:** DNA from serum or plasma
- **Amplification:** qPCR and rolling circle amplification [1]
- **Library preparation:** Illumina protocol [1]
- **Sequencing:** Performed on Illumina platforms
- **Data Analysis:** SCANellome V2 to study the anellome [2]

Results

- 3 out of 6 donors positive for anelloviruses
  - Comparison of composition and development of anellome in recipients.
- Recipient 3 and 4→ no detectable donor lineages
- Recipient 1 → one of 15 lineages identical to a donor lineage
  - High anelloviral DNA (>10^{10} copies/mL) from start
  - Used immunosuppressive therapy before Tx
  - Had multiple bacterial + viral infections

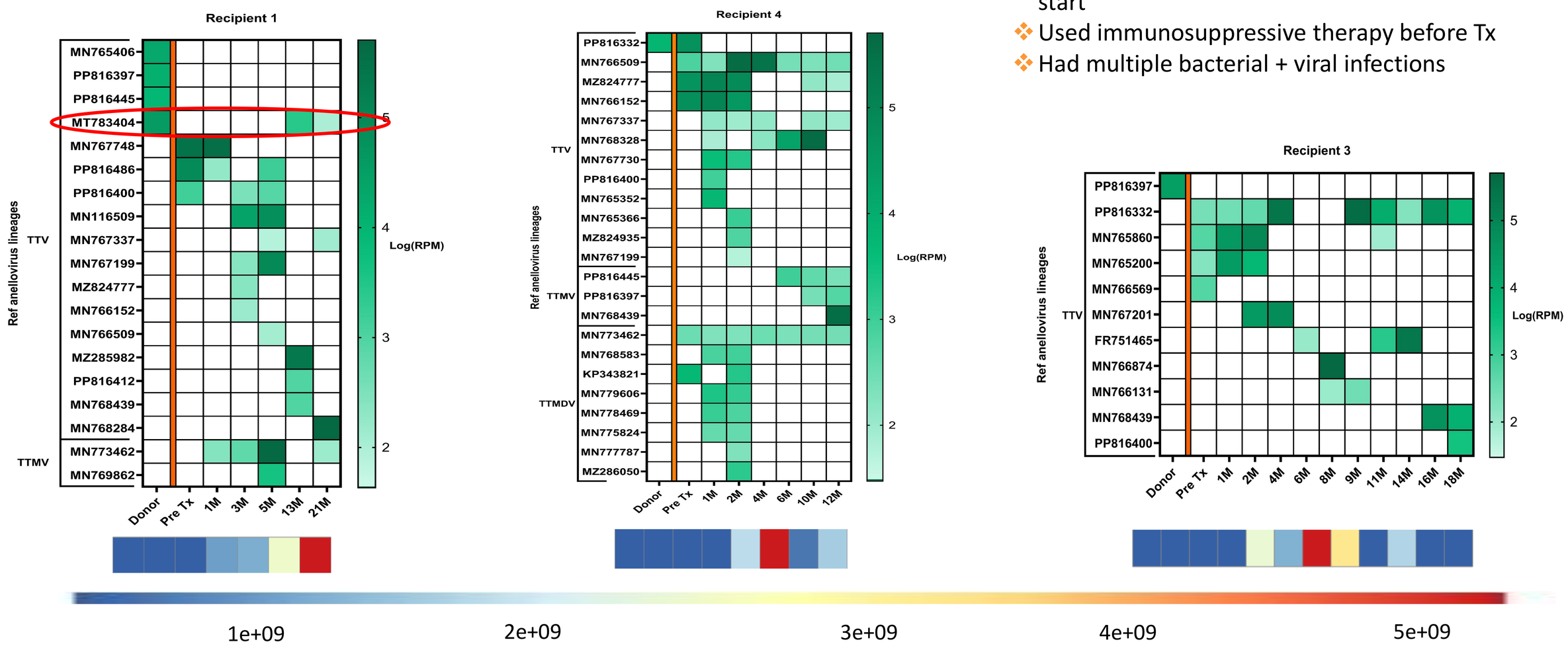

Figure 1: Heatmap of the anelloviruses lineages in reads per million (RPM). qPCR determined TTV-loads per sample in copies/mL are shown in the multicolored heatmap below the anellome heatmap.

Conclusion and discussion

- **Recipient 1: presumable donor derived lineage, suggesting a more impaired immunity .**
- **All recipients: multiple lineages visible, including new lineages → unclear if it is donor or recipient derived.**
- **More donor/recipient pairs, including living-related pairs, will be screened to explore these findings.**
- **Follow-up of TTV loads after kidney transplantation shall give more insight on the balance between immunosuppression and individual immunity.**

References

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l.s.klomp@amsterdamumc.nl