

sncRNAs in healthy human pregnancies

Investigating the Small Non-Coding RNA Transcriptome of the Human Placenta

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The **placenta** is the fundamental organ required throughout **pregnancy**. Precise gene regulation in the placenta is crucial in maintaining a healthy pregnancy¹.

Small non-coding RNAs (sncRNAs) are known regulators of gene expression, with certain microRNAs already been associated with placental disorders ^{2,3} – however, **the global sncRNA profile of healthy placentas remains under-investigated**.

Impact

SncRNAs have recently been introduced as diagnostic / prognostic markers in several diseases and disorders

Elucidating changes in sncRNA expression within the placenta throughout pregnancy would aid in early and better-informed intervention and care of pregnant women.

Hypothesis

The expression of sncRNAs changes dynamically throughout pregnancy in the healthy human placenta

Methods

30 control placentas at stages of gestation

Trimester 1 = 5, Trimester 2 = 16, Trimester 3 = 9

Fetuses: **17 Females**, **13 Males**

Total RNA extracted and sequenced

linear model:

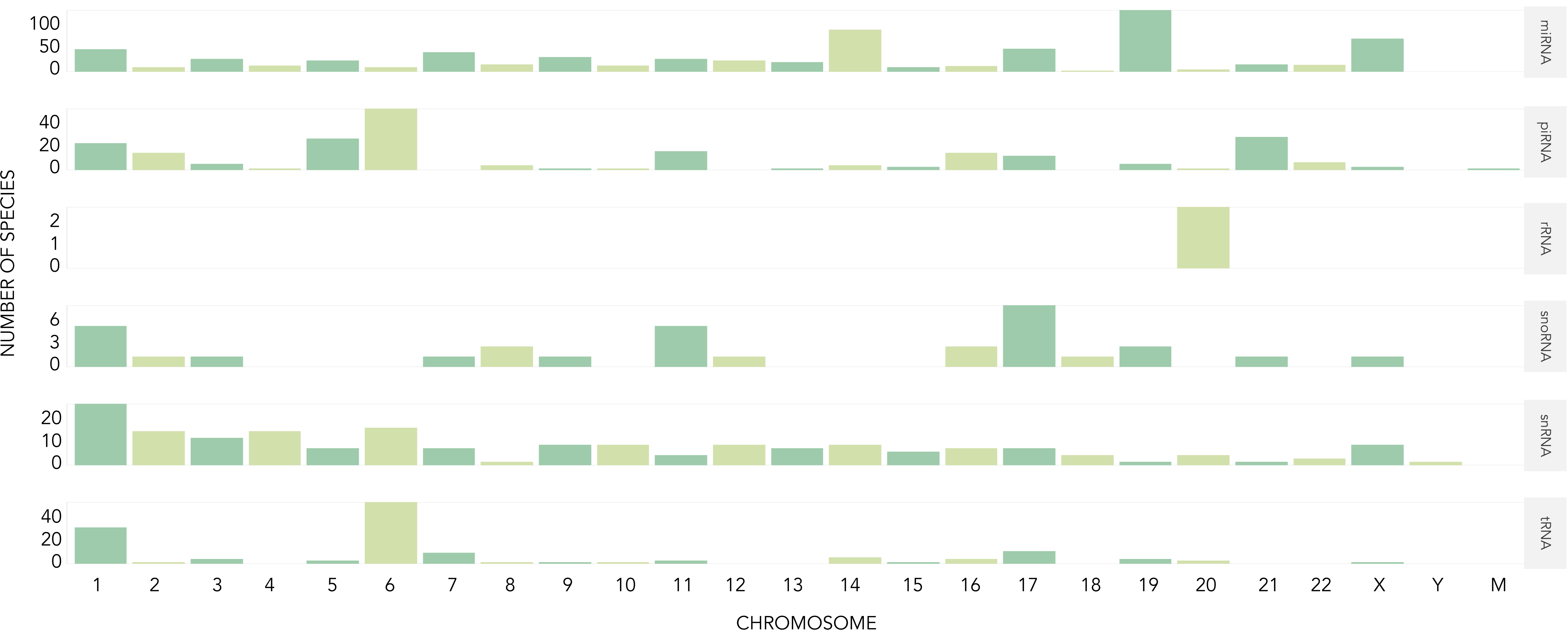
~sncRNA + Trimester + Sex + Flow Cell

Conclusions

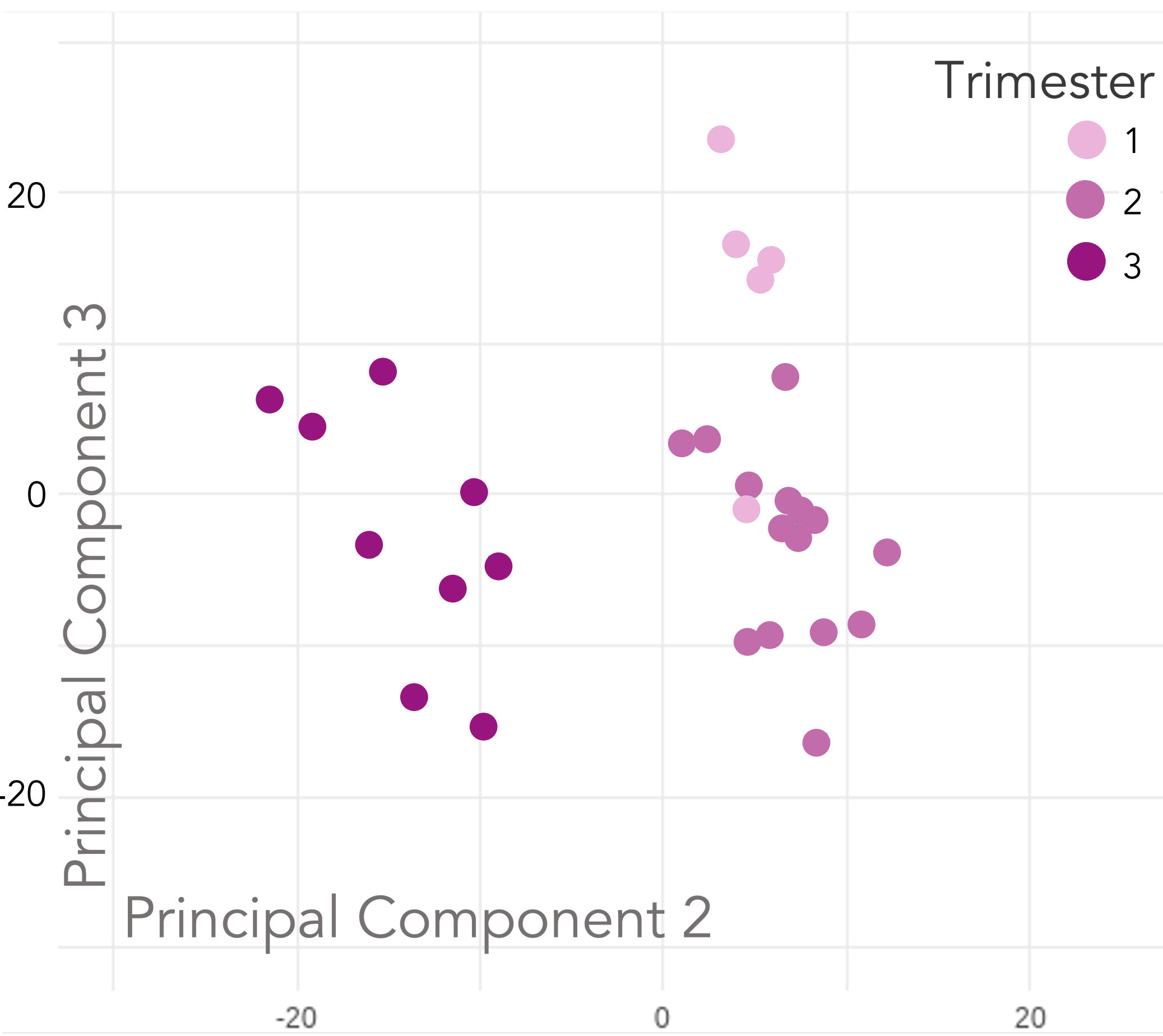
The human sncRNA profile changes with **gestational age**, indicating timely and fixed regulation of gene expression.

Technical factors can significantly **contribute** to the **varied expression patterns**, and need to be accounted for.

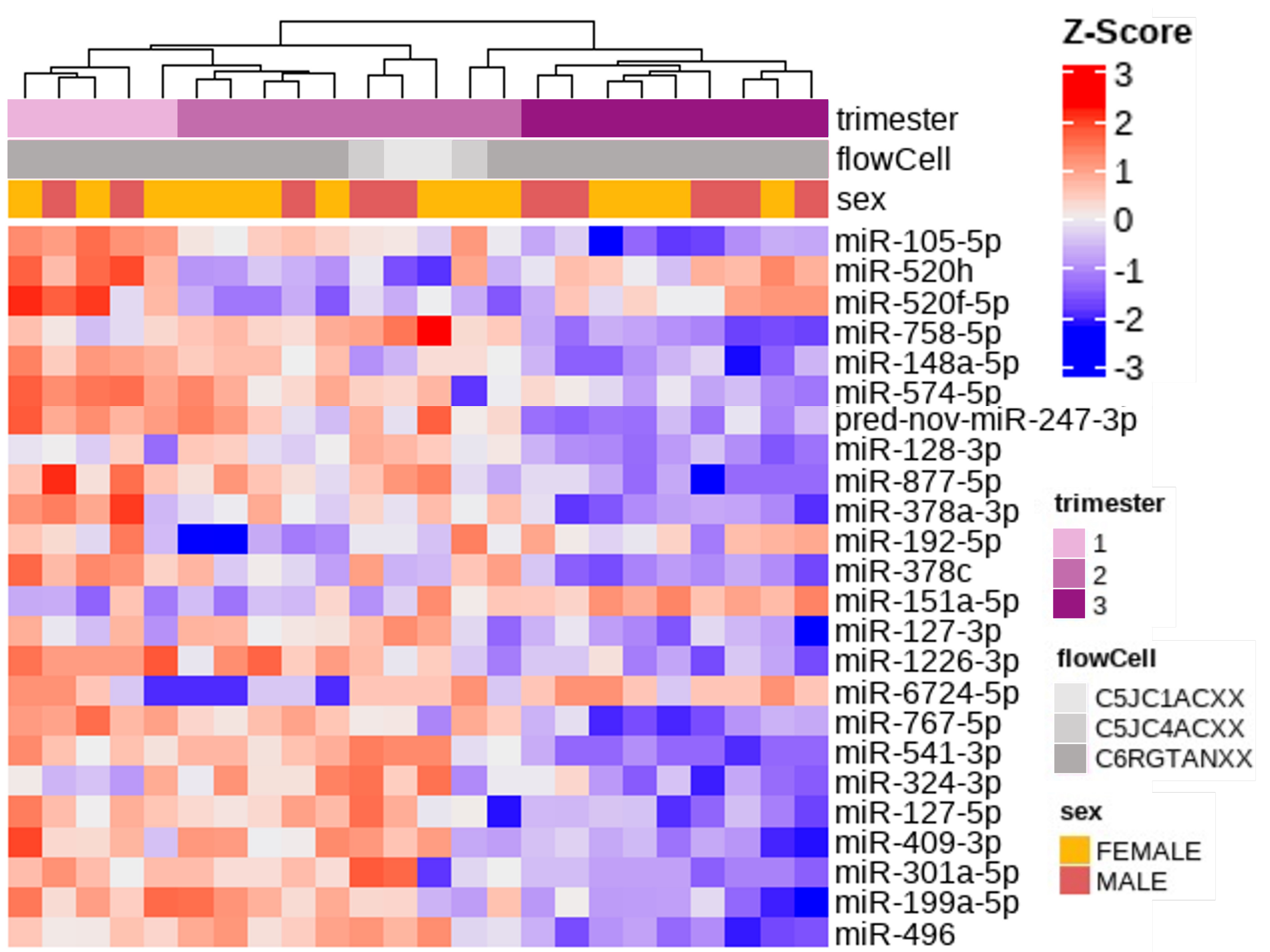
Placental differentially-expressed sncRNAs are present genome-wide



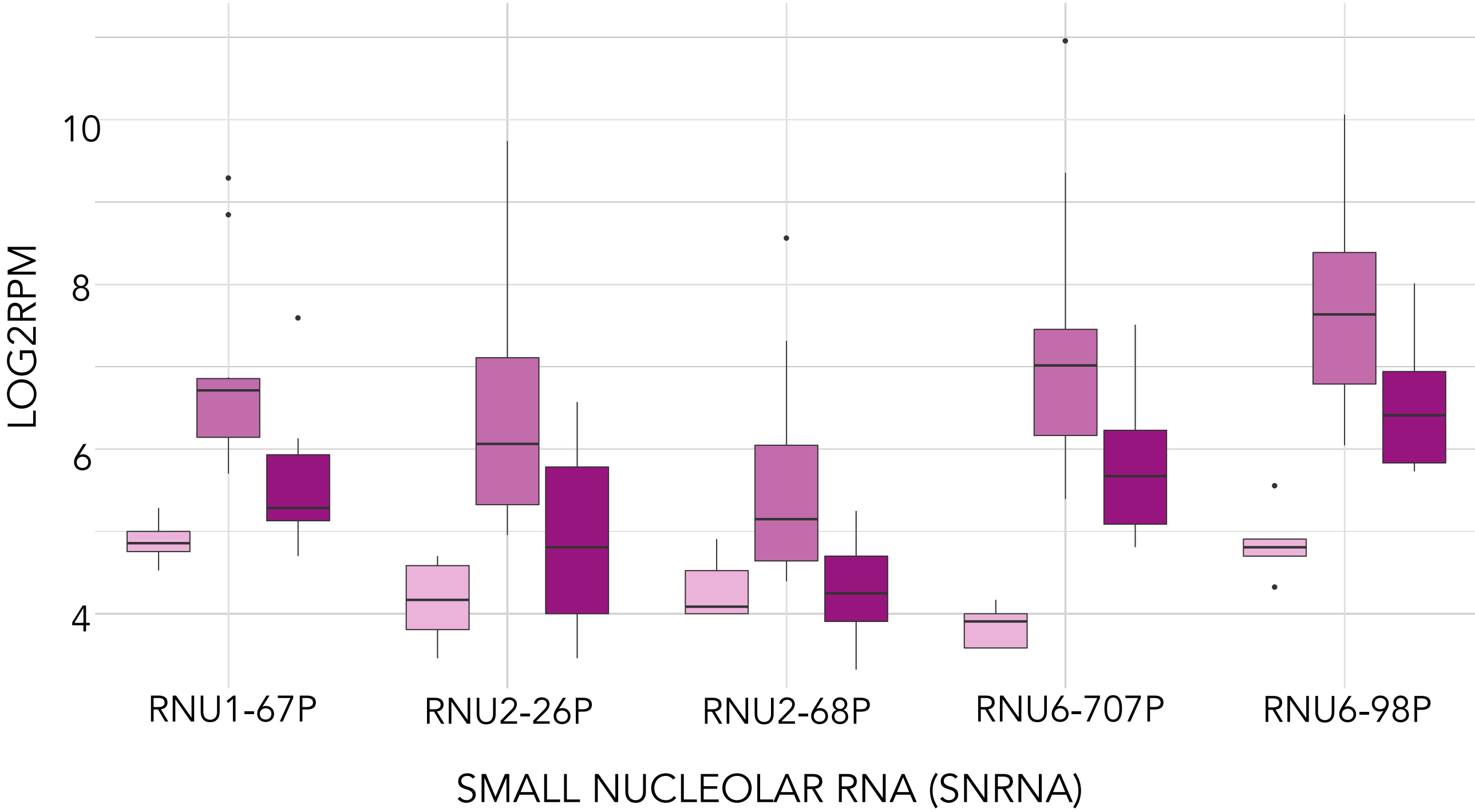
Samples separate by trimester



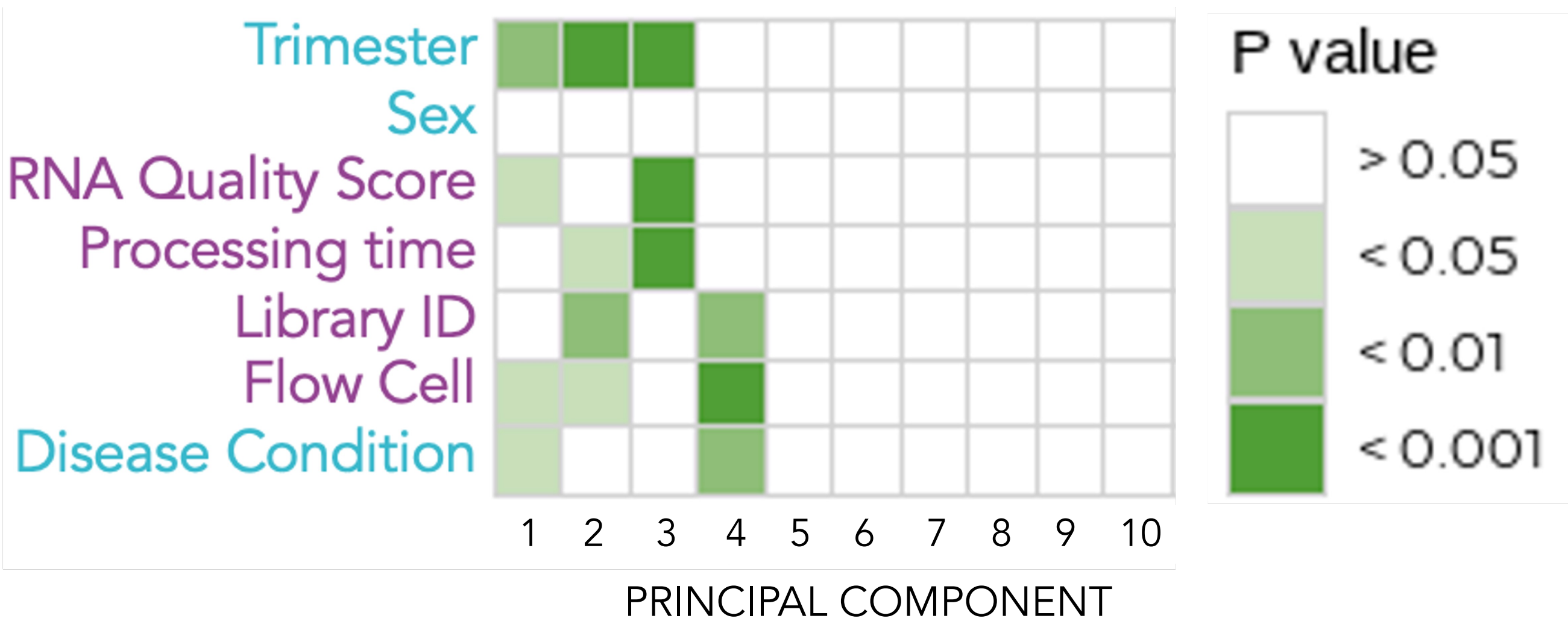
24 miRNAs (1 novel) show changes in expression within all 3 trimesters



Chromosome X shows sncRNAs with trimester-dependant expression



Non-biological factors may also alter expression



1. B. Cox, et al., (2015). 2. J.-F. Mouilletet al (2015). 3. D. M. Morales-Prieto, et al., (2013).