

The lung microbiome of an OVA +/- vitamin D model

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Conclusions: The lung microbiome is influenced by dietary vitamin D status, sex and OVA induced airway allergy.

Background: Vitamin D may be essential for restricting the development and severity of allergic diseases such as asthma, but a causal link to vitamin D deficiency has yet to be established. We hypothesize that vitamin D modulate lung microbiota to regulate asthma. We describe the influence of vitamin D in the most used model for airway allergy on the lung microbiome.

Results:

- The naive lung microbiome is dominated by *Proteobacteria*, *Firmicutes*, *Actinobacteria*, *Bacteroidetes* and *Cyanobacteria*
- Vitamin D status has significant influence on lung microbiome composition in OVA treated male mice (Table 1)
- Airway allergy shifts the microbial community across all experimental groups (Fig 1)
- Pseudomonas* was significantly more abundant in OVA Male VitD – mice (Fig 2)
- Supplementation has an effect in male vitamin D deprived mice
- Between sexes, there are differences between OVA treated female and males, except in the supplemented groups.

Comp	Sex	Treatment	VitD	Supp	R-value	p-value
Comp 1	Male	Naive	+/-	0/0	0,03	0,270
Comp 2	Male	Naive	-/-	0/1	0,12	0,031
Comp 3	Male	Naive	+/-	0/1	0,06	0,147
Comp 4	Female	Naive	+/-	0/0	0,01	0,427
Comp 5	Female	Naive	-/-	0/1	-0,01	0,506
Comp 6	Female	Naive	+/-	0/1	0,00	0,462
Comp 7	Male	OVA	+/-	0/0	0,72	0,010
Comp 8	Male	OVA	-/-	0/1	0,33	0,022
Comp 9	Male	OVA	+/-	0/1	0,64	0,008
Comp 10	Female	OVA	+/-	0/0	0,21	0,192
Comp 11	Female	OVA	-/-	0/1	0,04	0,484
Comp 12	Female	OVA	+/-	0/1	0,32	0,105
Comp 13	Male/Female	Naive	-/-	0/0	0,001	0,446
Comp 14	Male/Female	Naive	-/-	1/1	0,03	0,299
Comp 15	Male/Female	Naive	+/+	0/0	0,02	0,343
Comp 16	Male/Female	OVA	-/-	0/0	0,38	0,043
Comp 17	Male/Female	OVA	-/-	1/1	0,005	0,513
Comp 18	Male/Female	OVA	+/+	0/0	0,636	0,006

Table 1: We made 18 community comparisons (comp 1 -18). Sex, OVA treatment, vitamin D diet and supplementation, with analysis of similarity (anoism)

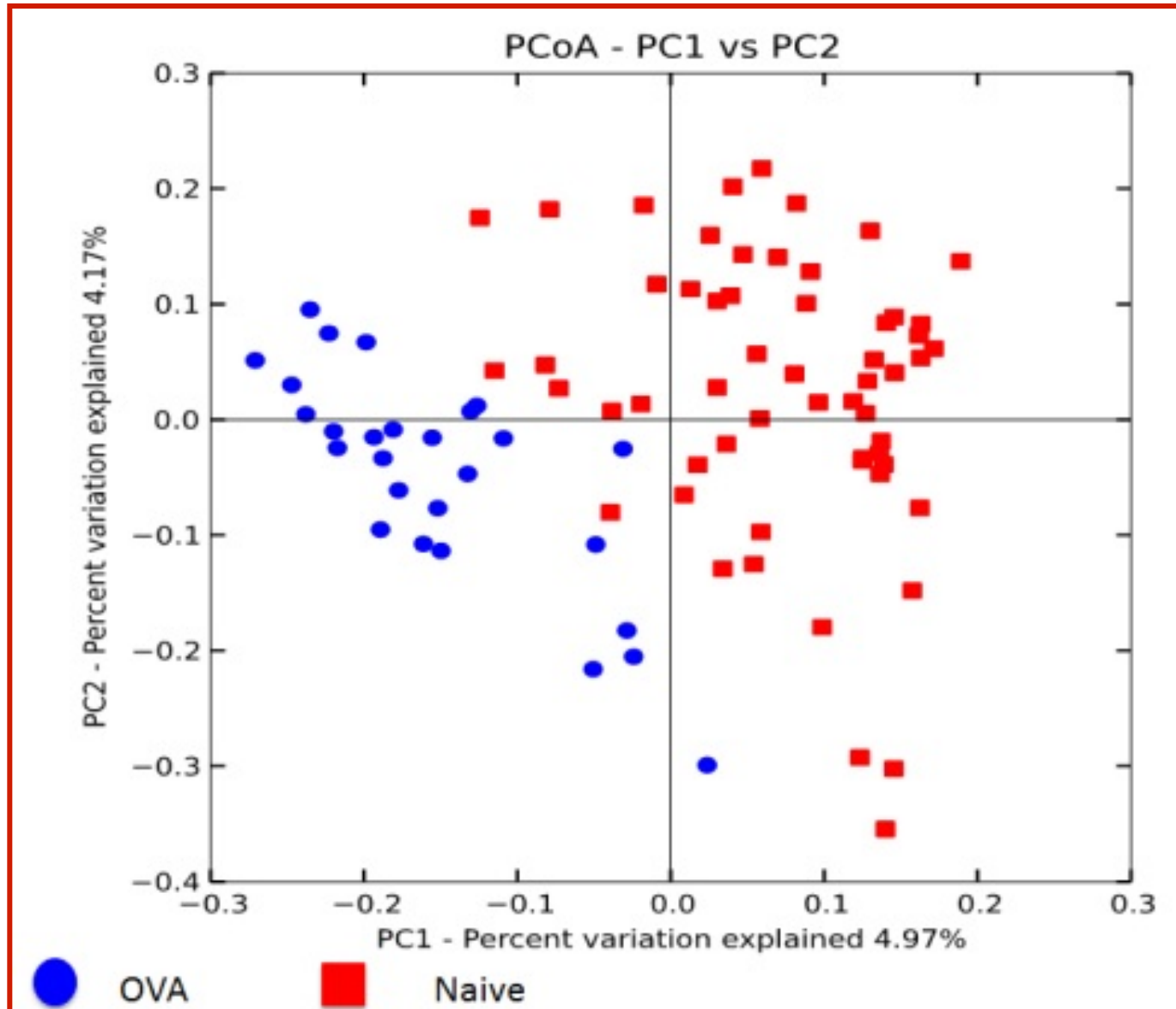


Fig 1: PcoA plot shows Community distribution according to OVA treatment

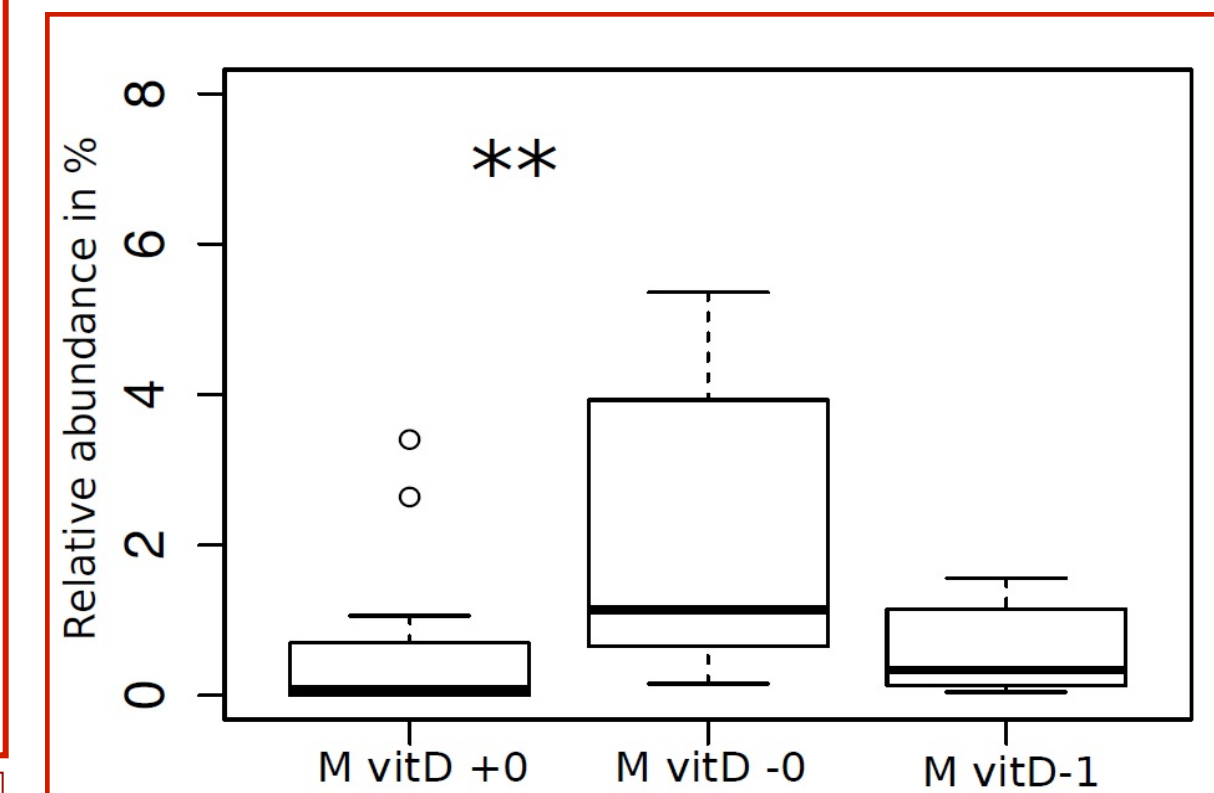


Fig 2: *Pseudomonas* is more abundant in OVA Male VitD deprived mice. p=0.009 wilcoxon rank sum test