CXCL9, a promising biomarker in the diagnosis of chronic Q fever

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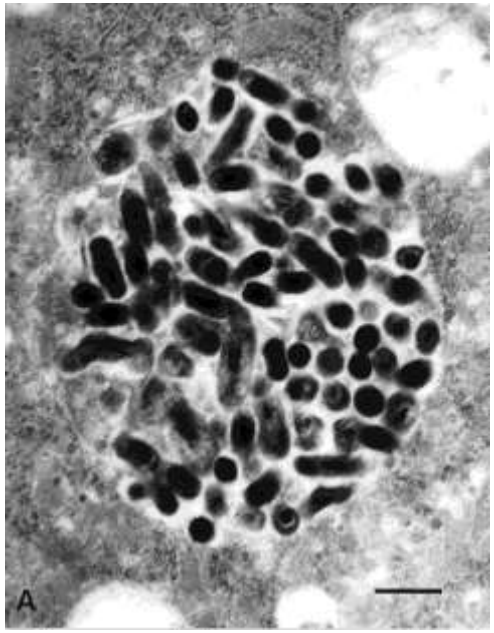
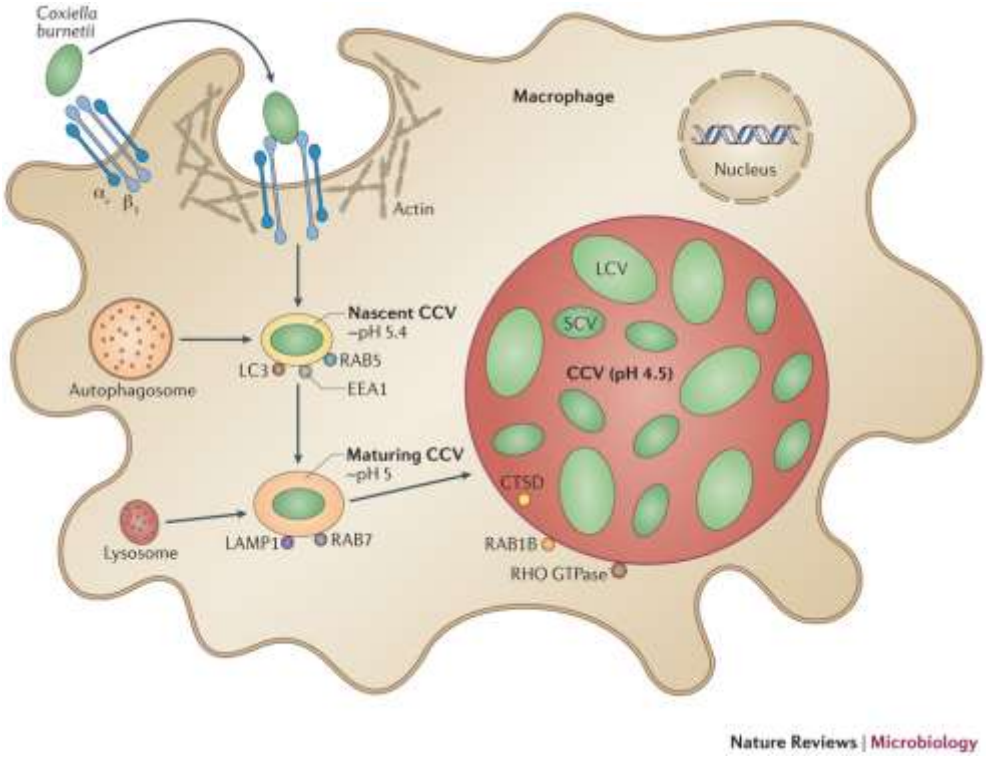
ECCMID

Radboudumc

Q fever

Coxiella burnetii





Dale Howe, and Louis P. Mallavia Infect. Immun. 2000;68:3815-3821

Van Schaik and Chen. Nature Reviews Microbiology. 2013;11: 561–573

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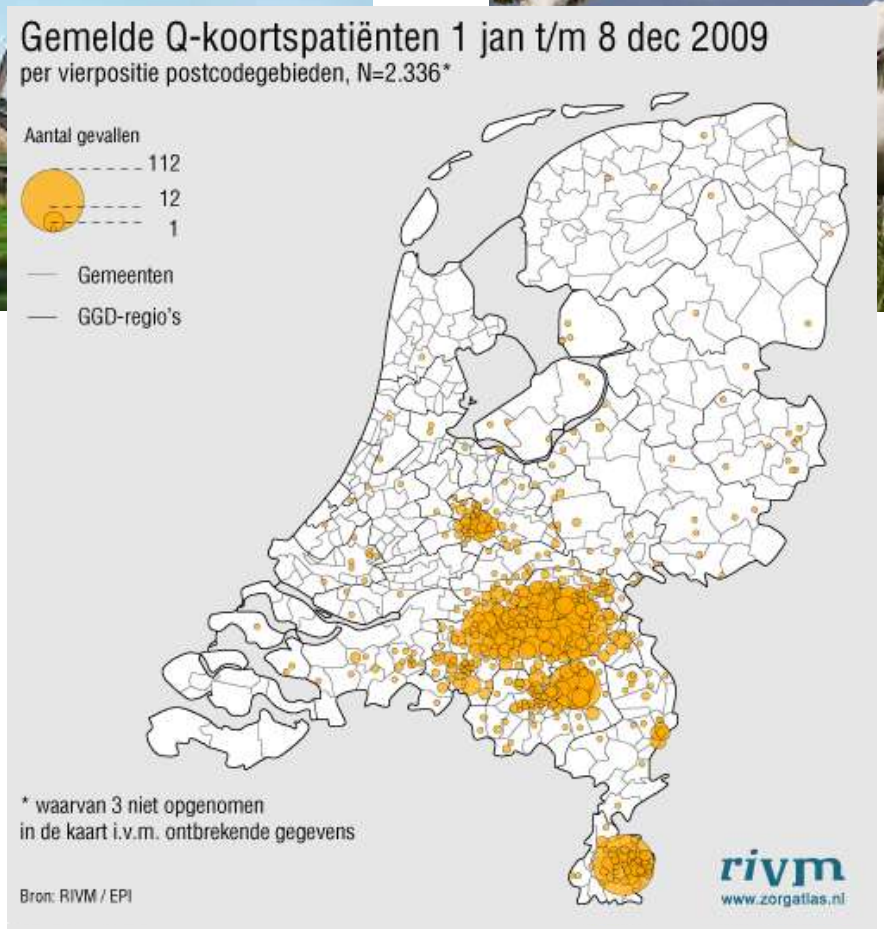
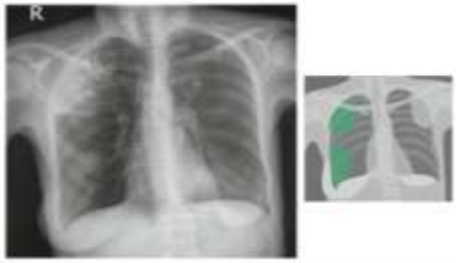
Dutch Q fever epidemic (2007-2011)



Clinical entities

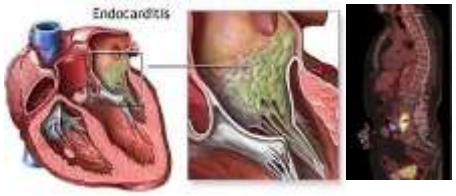
Acute Q fever infection

- Flu-like illness
- Pneumonia
- Hepatitis



Chronic Q fever 1-5%

- Vascular infection
- Endocarditis
- Spondylodiscitis



Cure

Diagnosis chronic Q fever

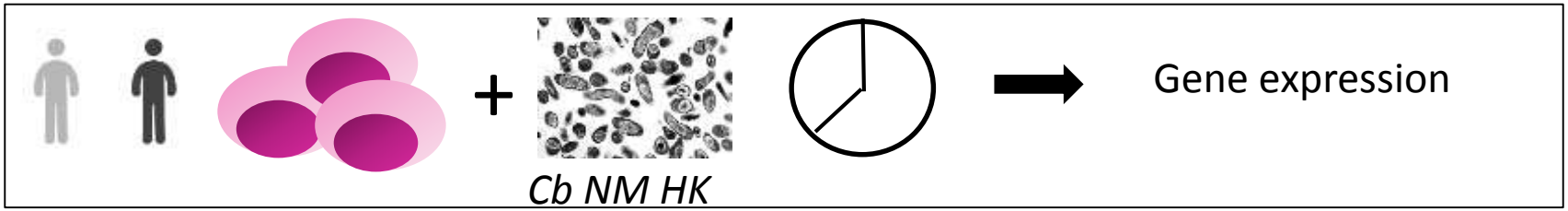
Combination of

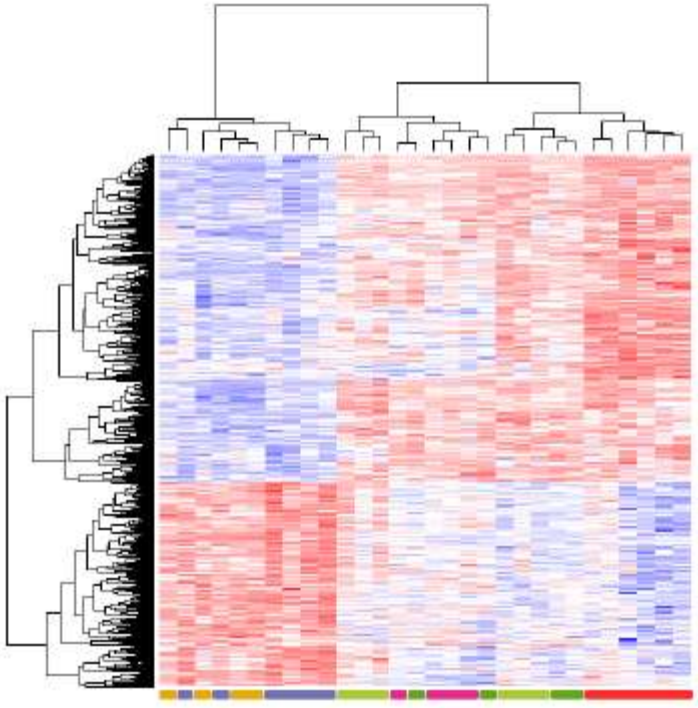
- Symptoms
- Microbiological evidence
  - PCR blood/ tissue
  - Serological
- Imaging

- Aspecific!
- Sensitivity <50%!
- False positives & negatives
- Interlaboratory differences

Can we identify biomarkers for diagnosis of chronic Q fever?

Microarray

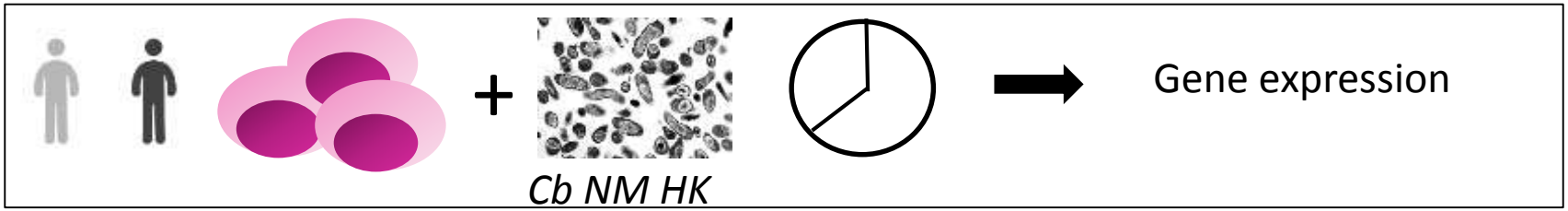




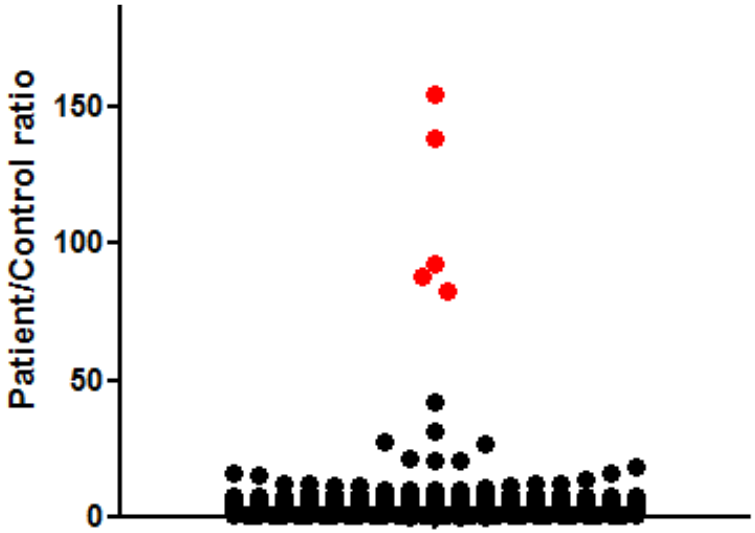
Chronic Q fever patients

Healthy control subjects

Microarray



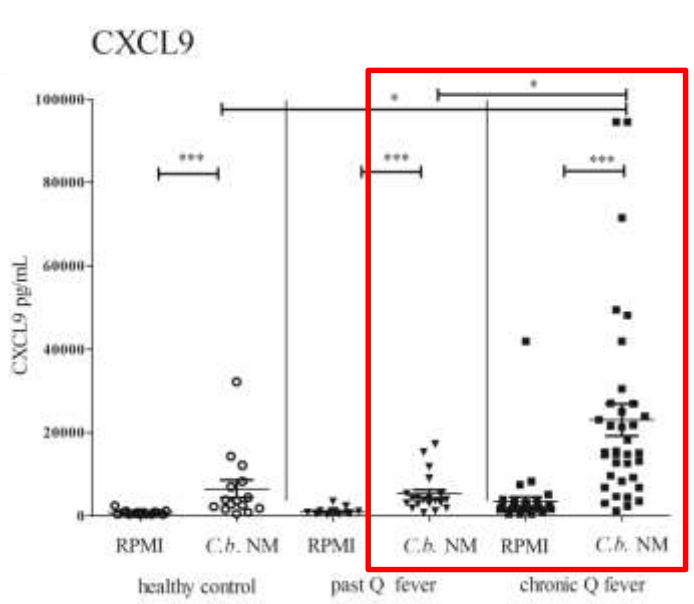
Differential gene expression of all genes

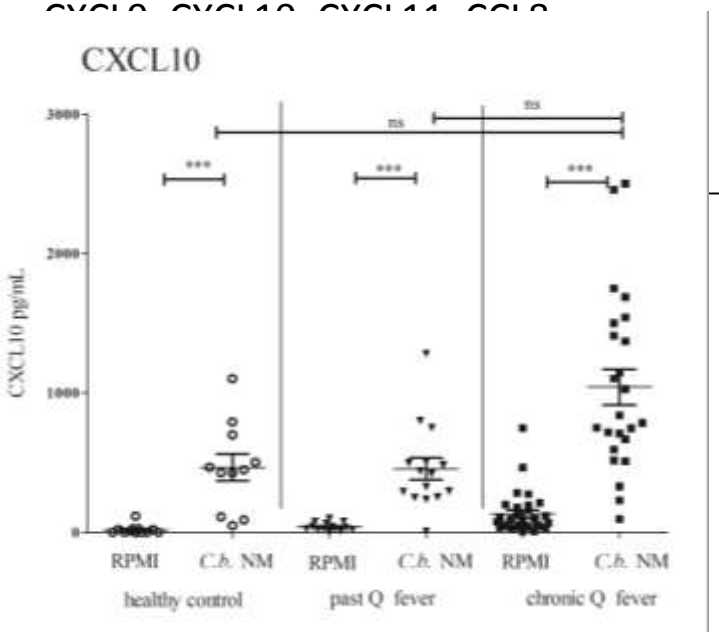


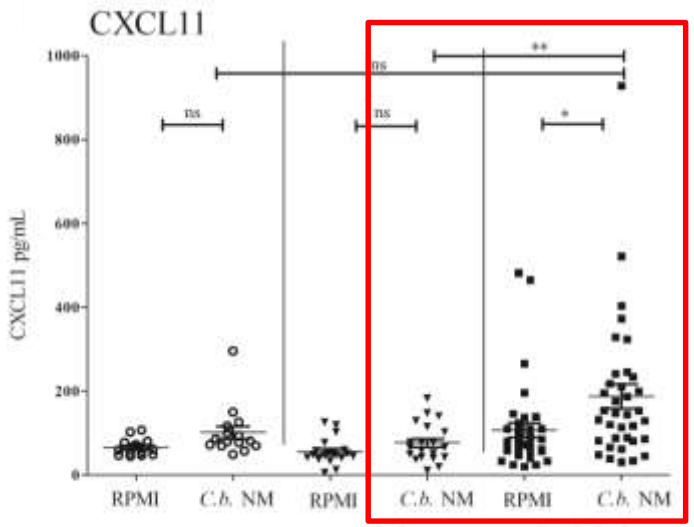
CXCL9	MIG
CXCL10 (2)	IP-10
CXCL11	I-TAC
CCL8	MCP-2

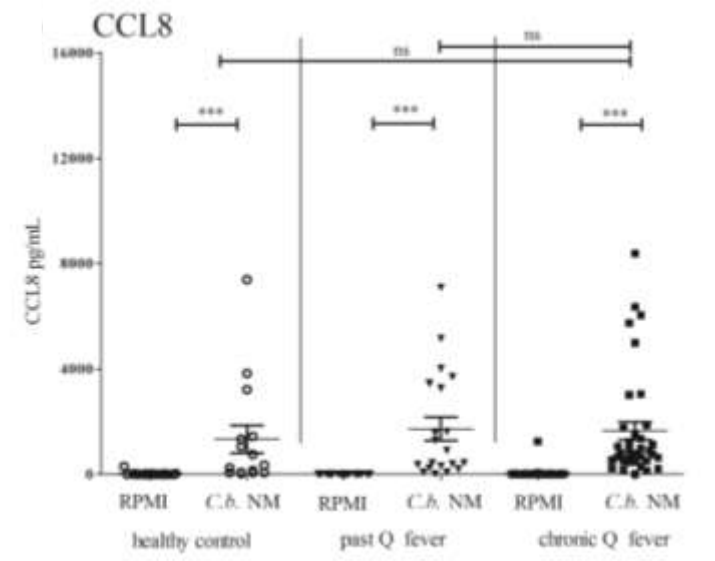
- Chemokines
- IFNγ inducible
- CXCR3 receptor
- Tuberculosis biomarkers

Production in stimulated whole blood

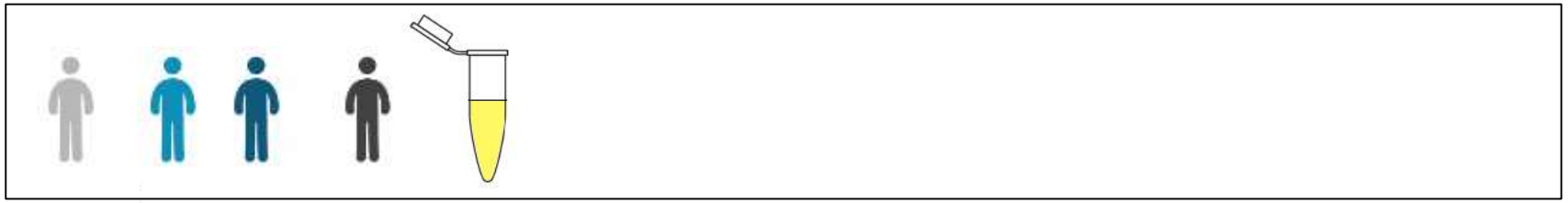


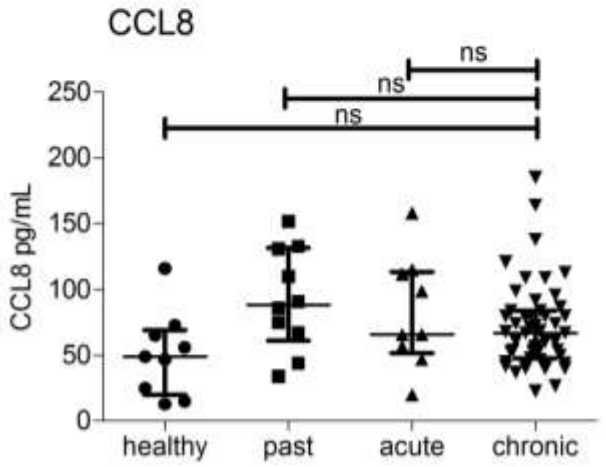




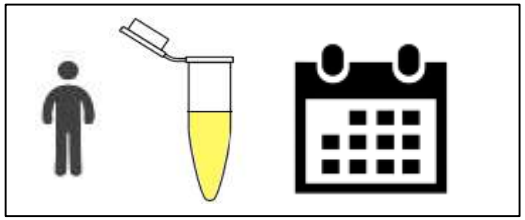


Serum concentration

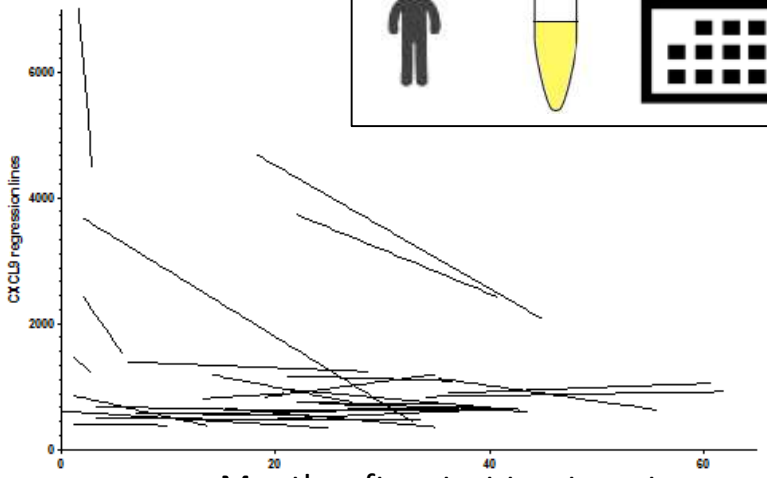




Concentration during treatment

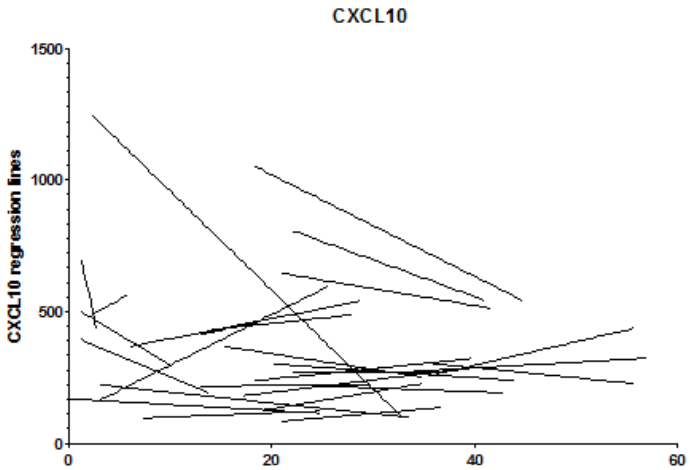


CXCL9



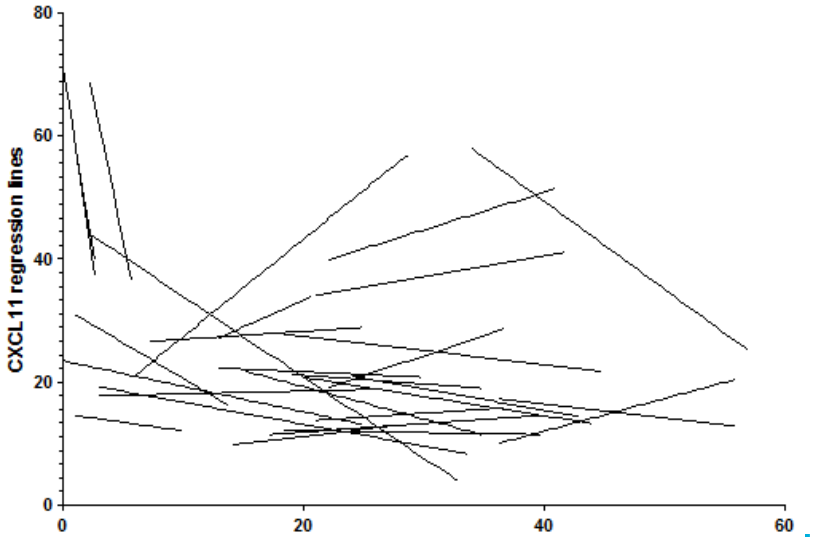
Months after start treatment

CXCL10



Months after-start treatment

CXCL11



Months after start treatment

High correlation among chemokines

No correlation with time after start treatment

Weak correlation with IgG phase I titers

Weak correlation with CRP

Summary

Preliminary data:

CXCL9 protein production and serum concentration is a promising biomarker

Reflection of IFNγ production

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