

Usage Scenarios

We showcase a selection of ten usage scenarios together with the feedback of cancer experts. These scenarios were created on an initial version of the framework that was enhanced afterwards.

Free Exploration

See **clusters** on the scatterplot and their characteristics/differences on the heatmap

Age and **ISUP** distribution is slightly different in the orange/green cluster



Feedback

This is an important analysis,
ISUP grade is higher in the green cluster!

Click on the heatmap cell of the **PSA-pre OP $\mu\text{g/l}$** to highlight its values



Feedback

Also interesting info: PSA value is not the distinctive criterion.

The top genes of a free selection



Feedback

This is really essential!

Deactivate the selection to see the **top genes** of the **complete** dataset
(PLEC and MED12 occur there too)



Feedback

That is generally interesting.

Switch to the **Clusters** view to show the differences between both clusters

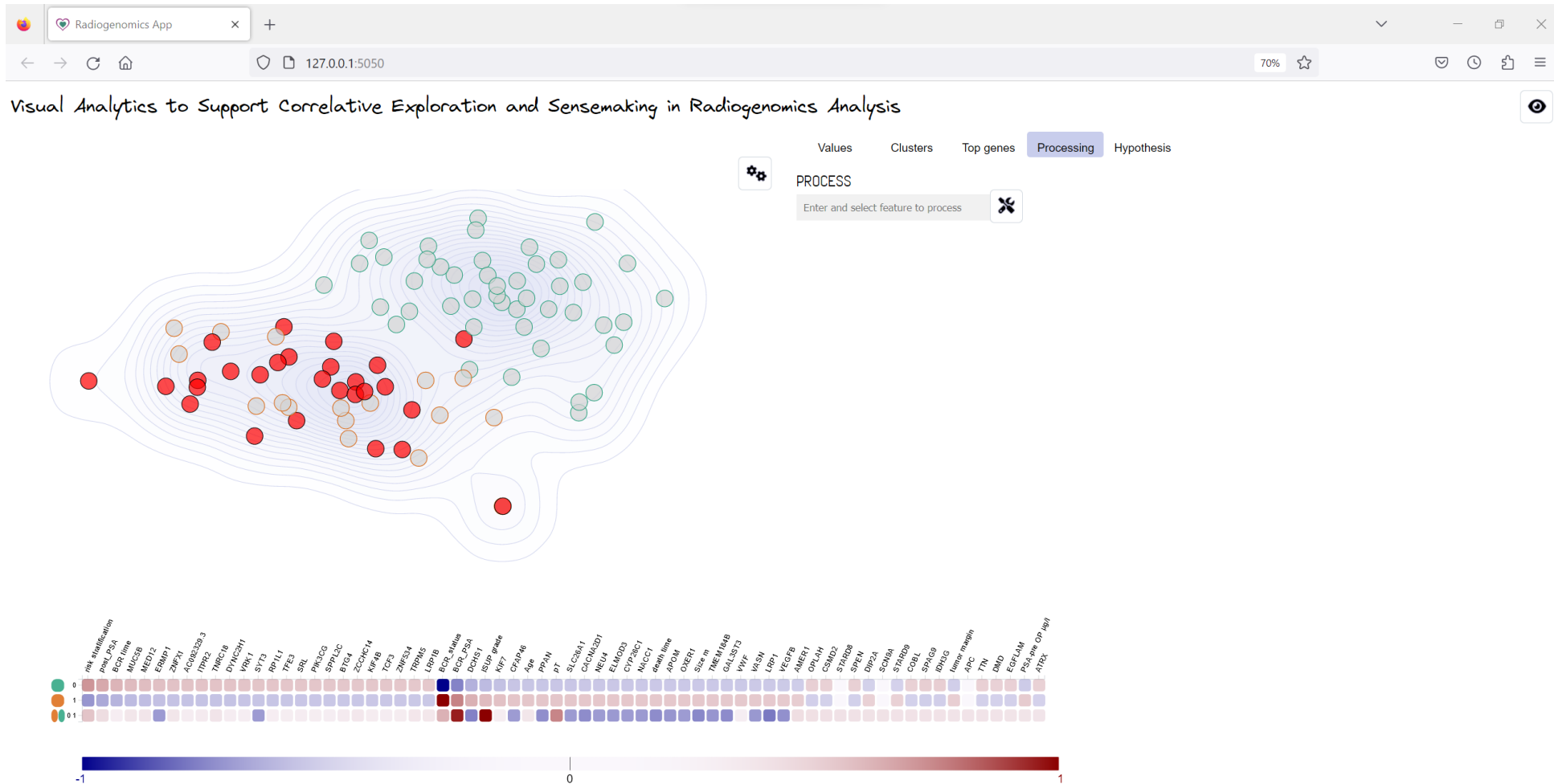


Feedback

This is interesting.

Select the **BCR status** on the heatmap to see why it is different ...

Biochemical recurrence (BCR): a rise in the PSA values after treatment, could mean that cancer came back



Feedback This is impressive. Could we link this to the ISUP grade?

... or the ISUP grade for all patients ...

ISUP: Grading scheme of the Gleason score to depict tumor aggressiveness

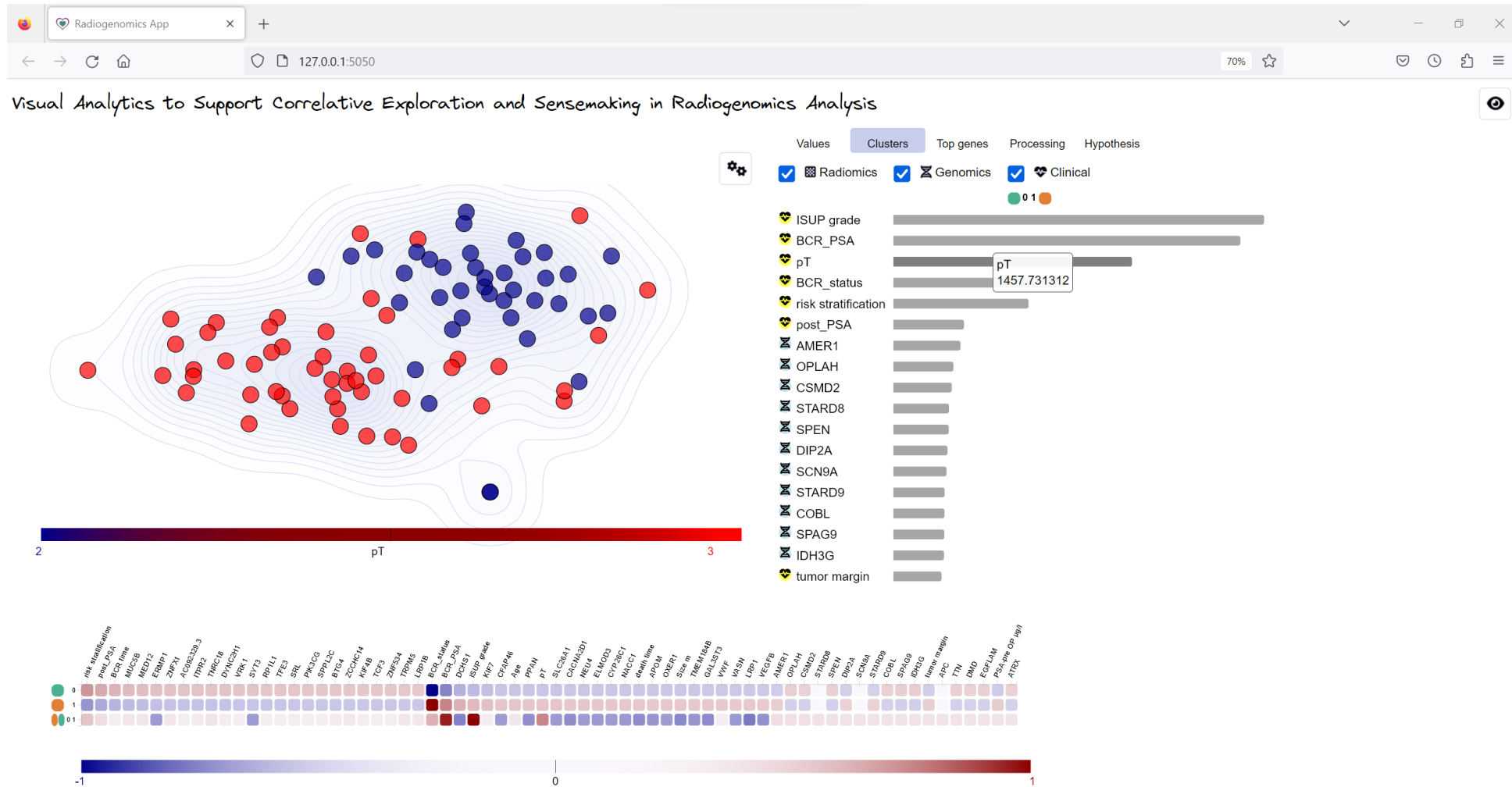


Feedback

It looks meaningful!

Show the differences of both clusters and select **pT** from there

Pathological stage (pT) determines how much cancer is within the body and if it has spread

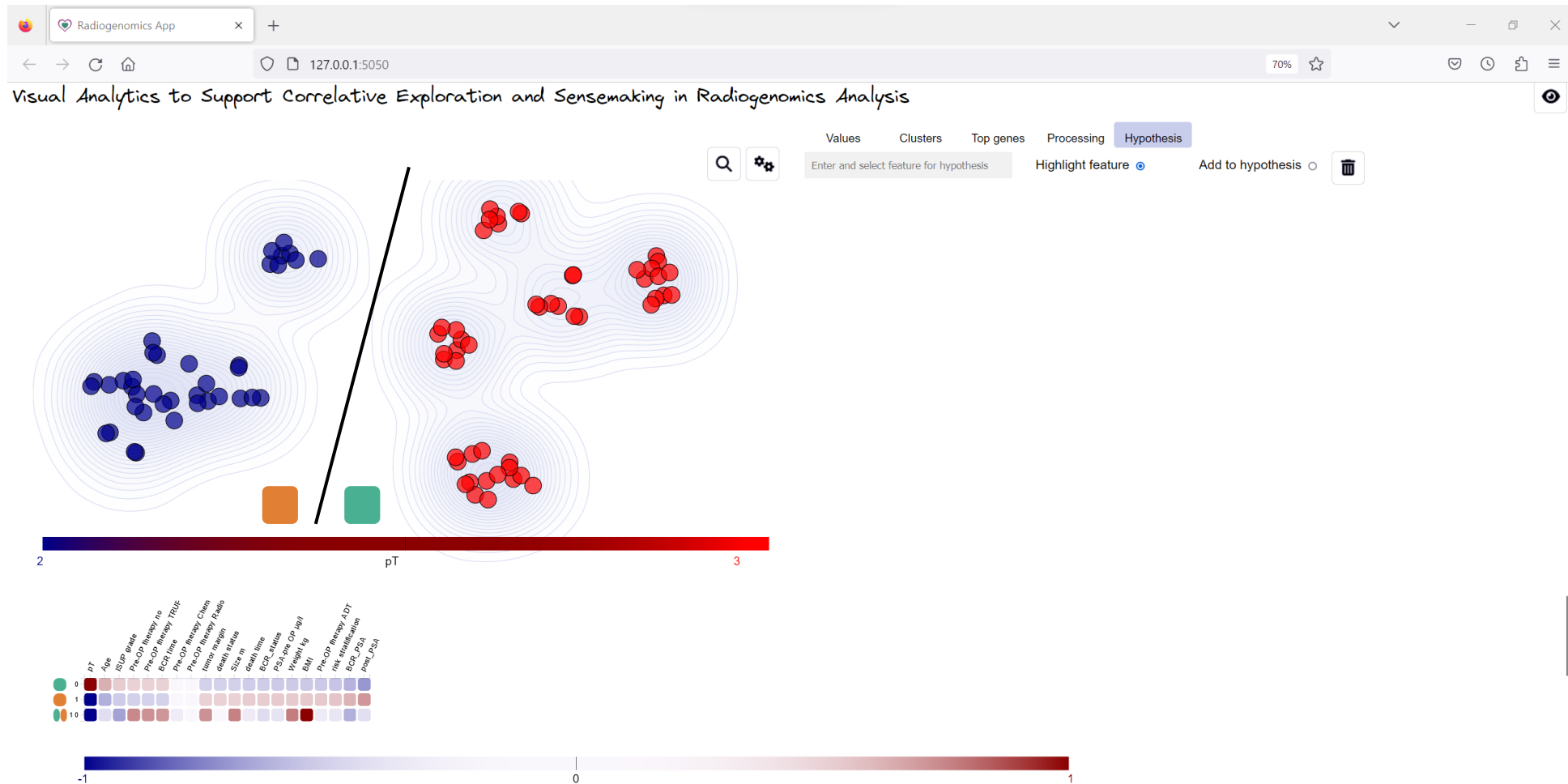


Feedback

Also this is impressive
And linked to BCR/ISUP.

Hypothesis-based Exploration

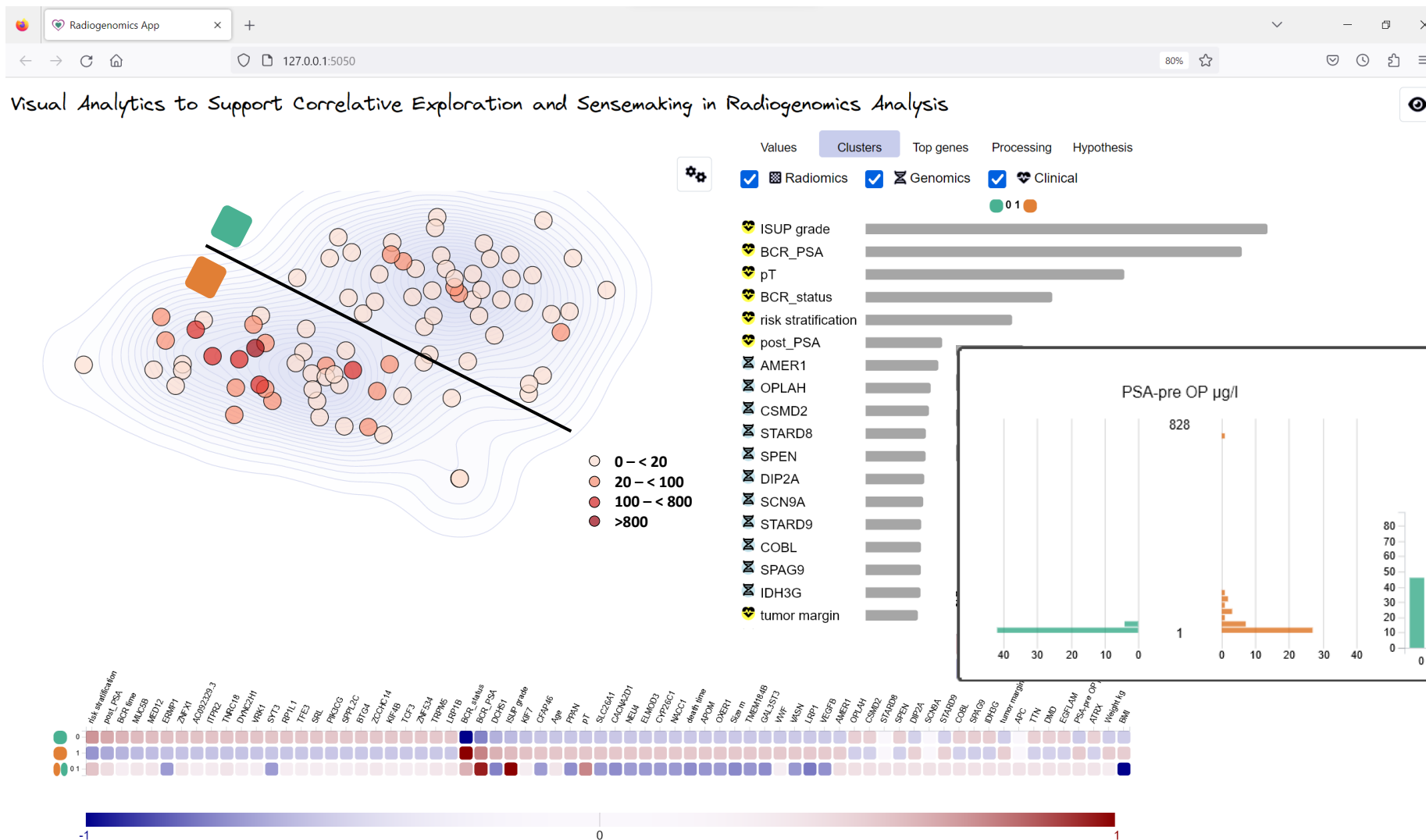
Is there a correlation between the **pT** and one of the **clusters** in the **clinical** dataset?



Feedback

Yes, very important.

Highlight the PSA-pre OP score in the combined genomic and clinical data ...



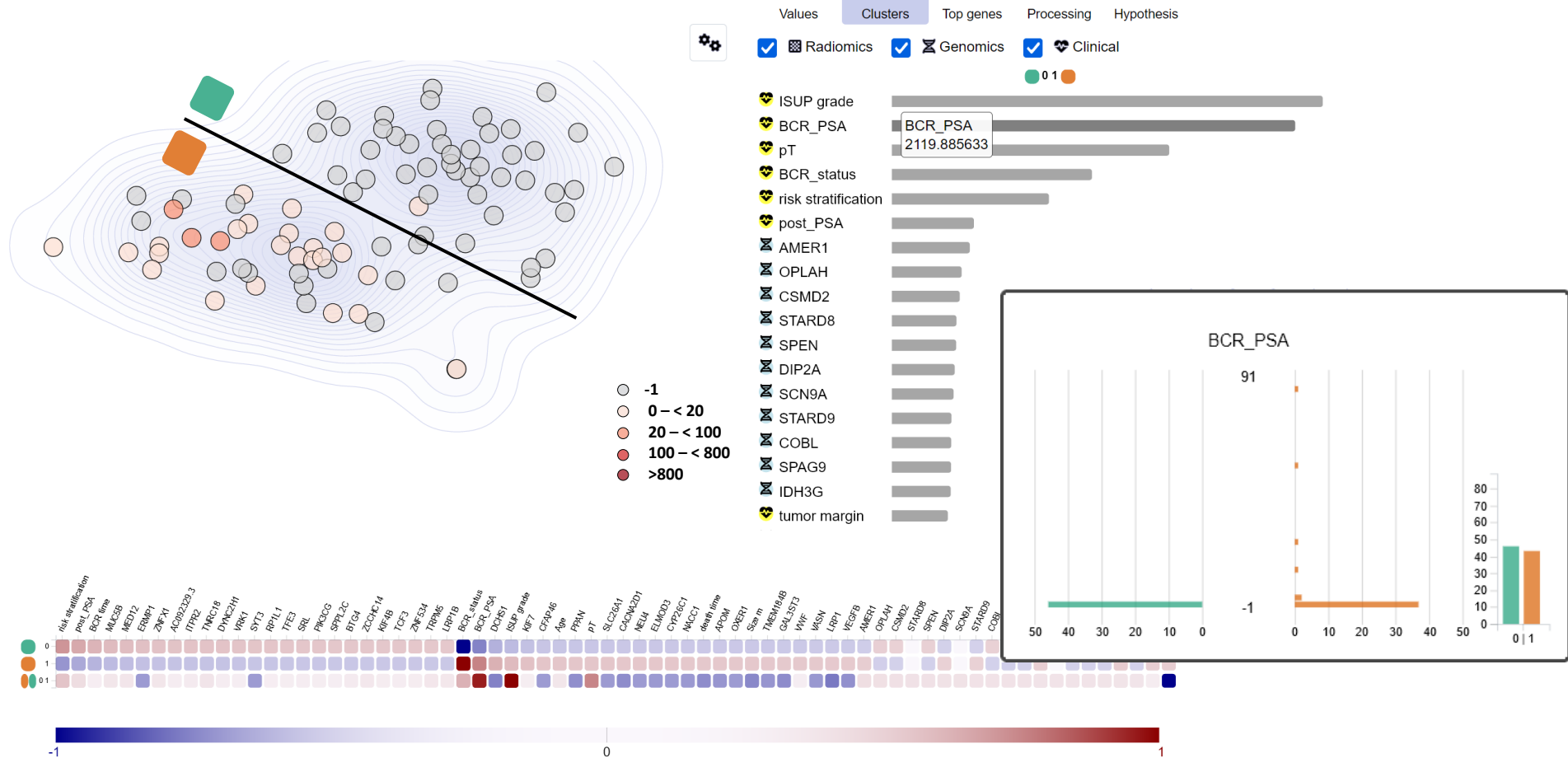
Feedback

Very interesting!

.. or the **BCR PSA** score in the combined **genomic** and **clinical** data ...



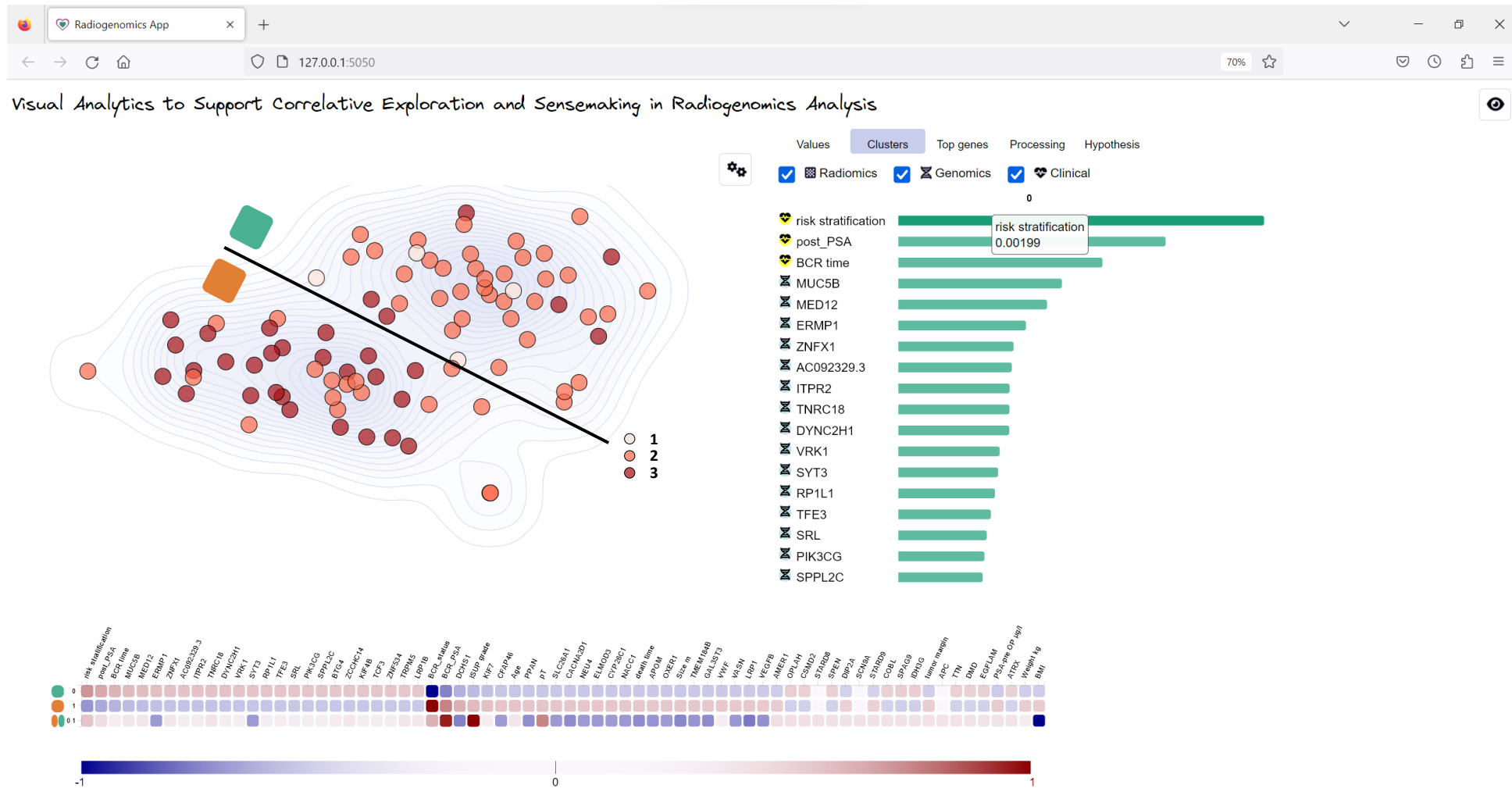
Visual Analytics to Support Correlative Exploration and Sensemaking in Radiogenomics Analysis



Feedback

The 3 orange patients also have higher ISUP grade.

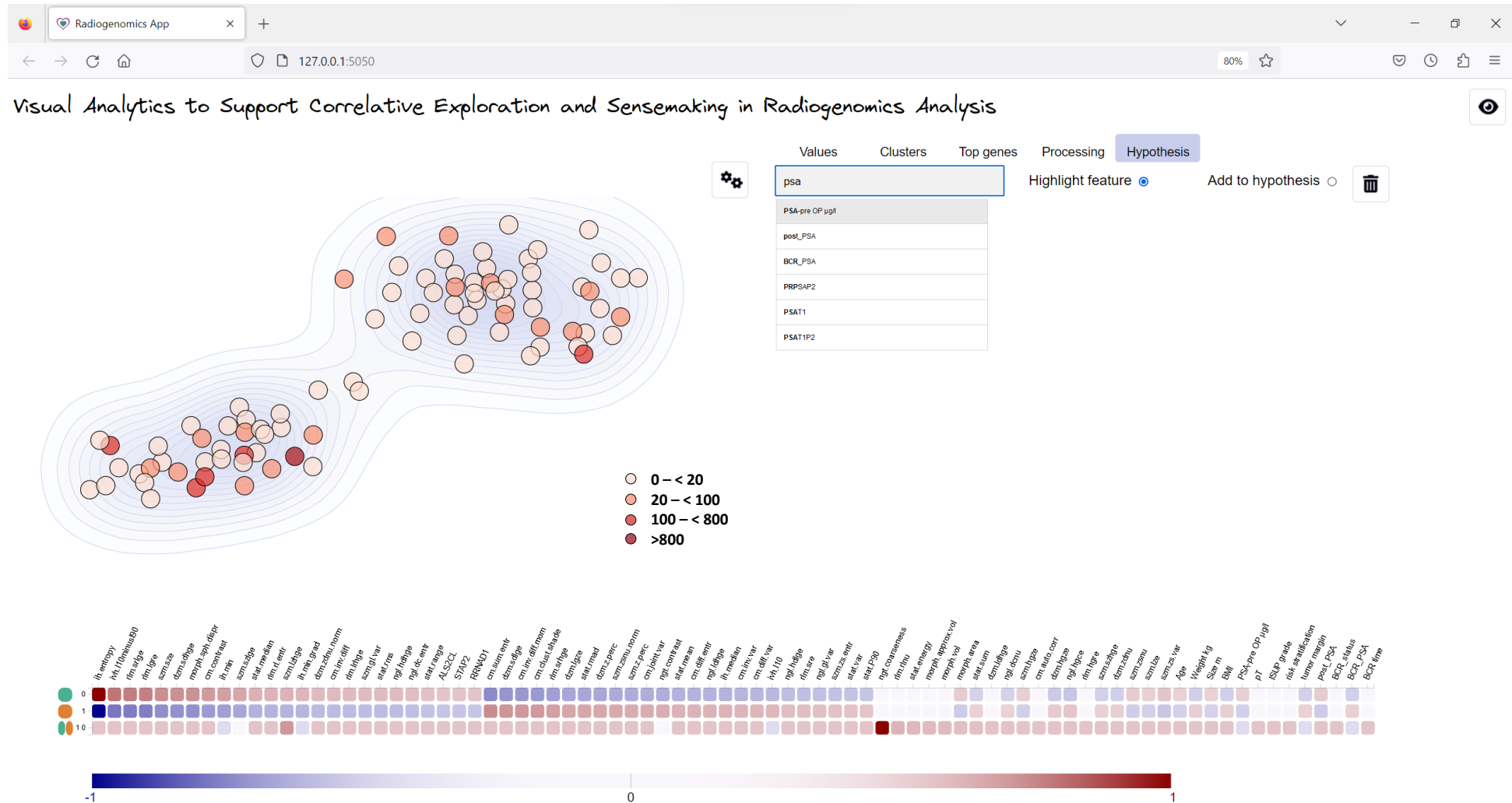
.. or the risk stratification in the combined genomic and clinical data ...



Feedback

Fits to the previous results!

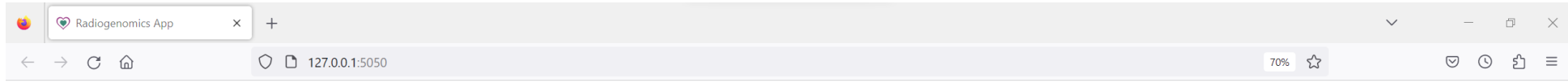
Is there a correlation between one of the **PSA values** and one of the **clusters** in the **complete** dataset?



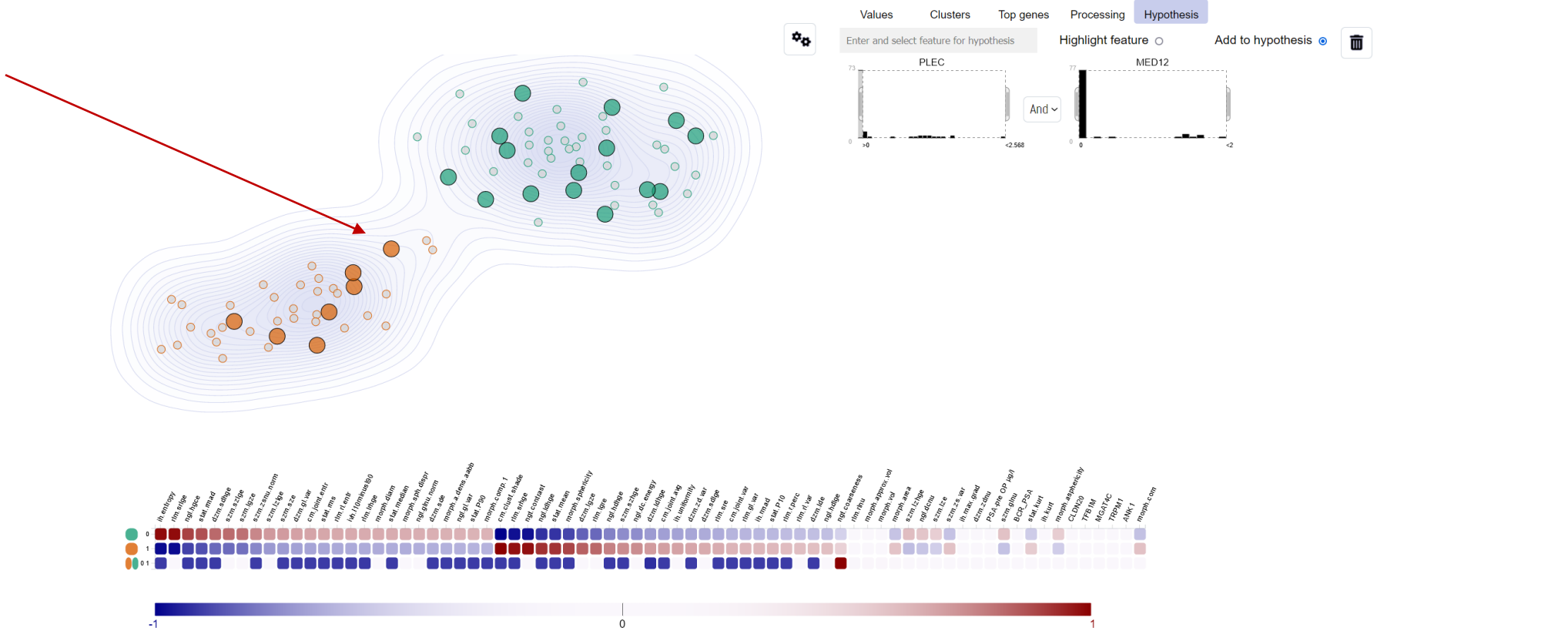
Feedback

PSA-pre OP
Seems to be enriched!

Everyone who has **PLEC** also has **MED12**.
(No, only one patient has both, but more have PLEC.)



Visual Analytics to Support Correlative Exploration and Sensemaking in Radiogenomics Analysis



Feedback

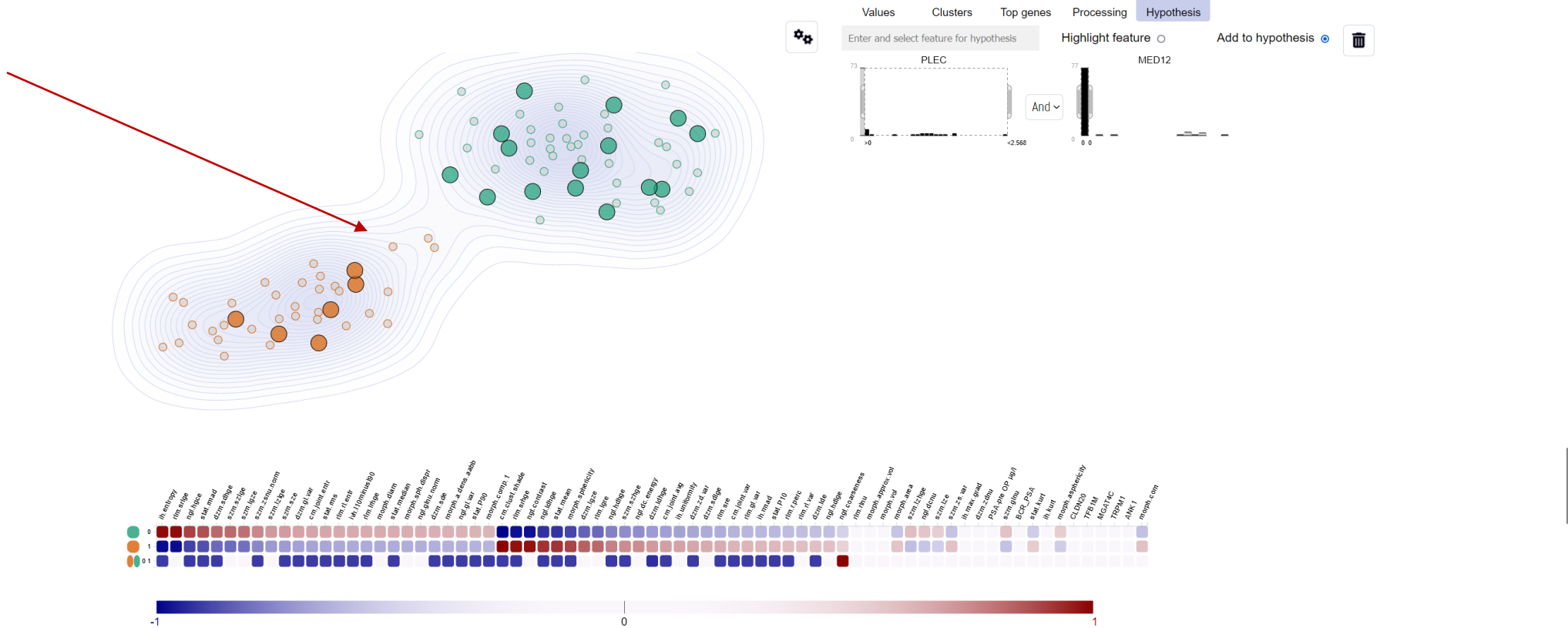
Interesting to see combined alterations!

Patients that have the **PLEC** gene, do not have **MED12**.

(False for only one patient.)



Visual Analytics to Support Correlative Exploration and Sensemaking in Radiogenomics Analysis



Feedback

Also interesting to see exclusion of genes.

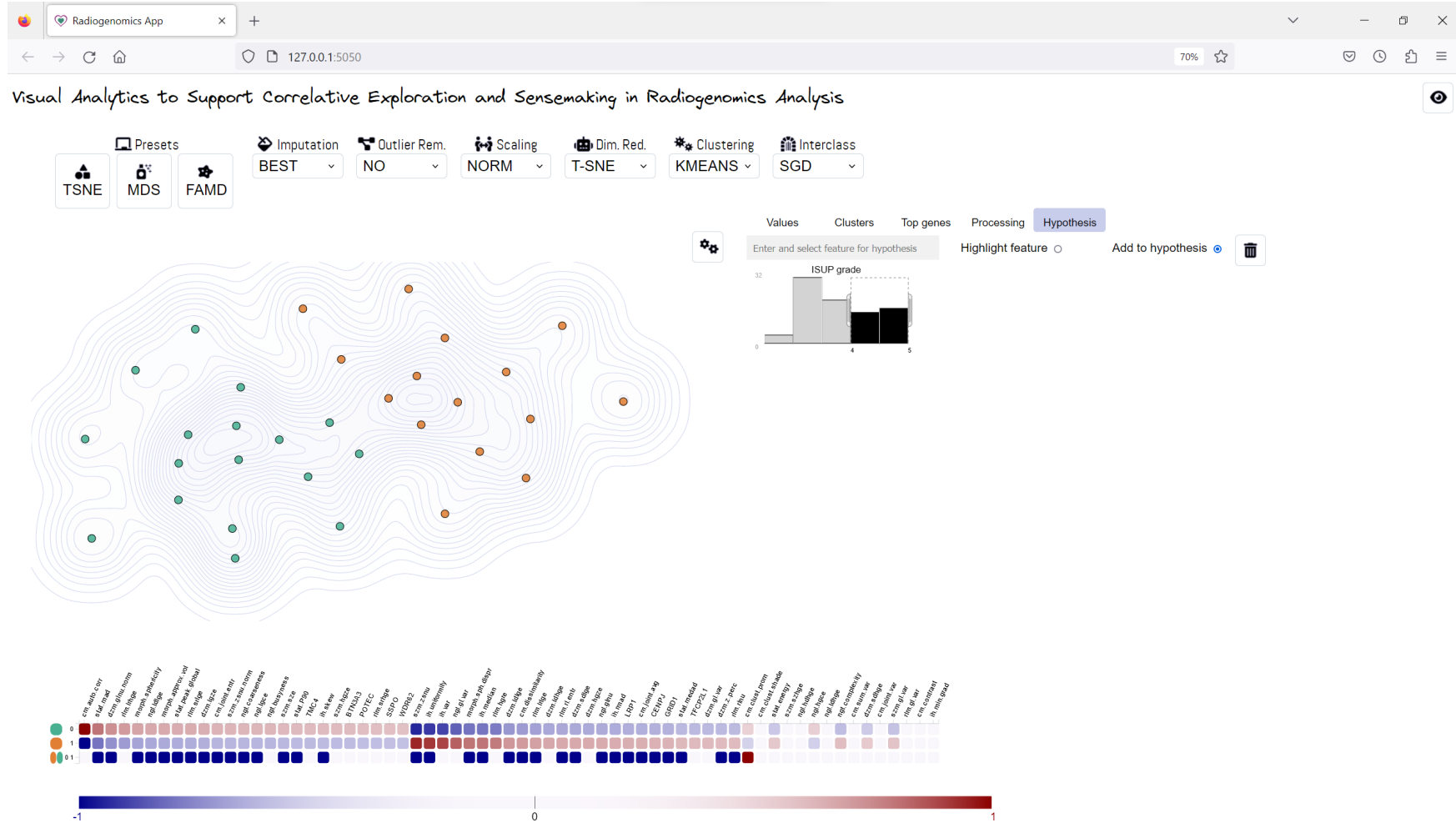
Patients that have the highest **PSA-pre OP** values, have **post PSA** values starting from 36 and **BCR PSA** values starting from 8 and do **not** have the **MED12** gene and have an **ISUP** of 5. (Yes, true for all.)



Feedback

This is an interesting result!

Advanced options are available on demand



Feedback

This is for later refined application!