Introduction to precision medicine with focus on novelties and pain management

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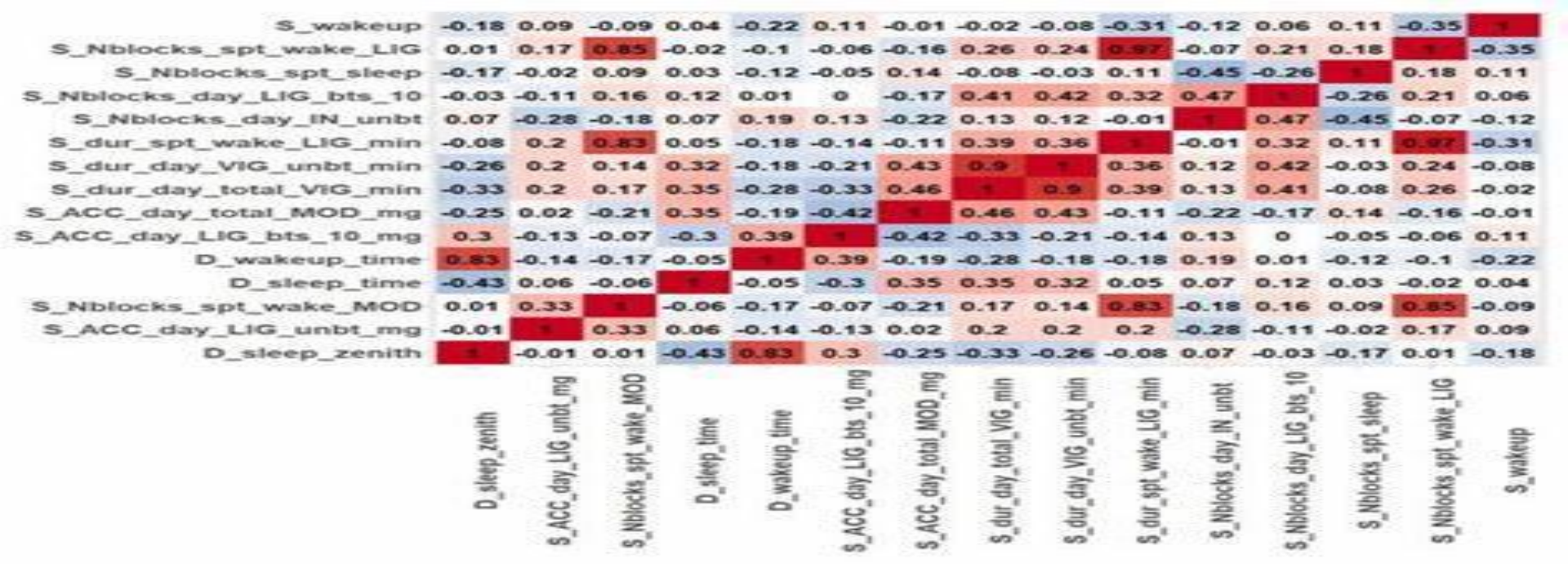
Hot topics terminology

- Evolutional biology
- Genetics
- Epigenetics
- Longevity
- Tunnel vision
- Heterogeneity…population based data….philosophy
- Mathematical models
- Optimization/multi criteria decision making(MCDM)

- ***Precision medicine/precision HEALTH***
- Precision Public Health I Data-driven decision support for families, communities, clinics, social networks, and other entities . Potential treatments can also be policies. Precision Health Union of precision medicine and precision public health. We always consider the consequences of our actions on the populations involved not just narrow subgroups or individuals



$$ \begin{align} \frac{dS}{dt} &= -\beta SI \\ \frac{dE}{dt} &= \beta SI - \sigma E \\ \frac{dI}{dt} &= \sigma E - \gamma I \\ \frac{dR}{dt} &= \gamma I \end{align} $$

Where:

SS is the number of healthy cells.

EE is the number of pre-cancerous cells.

II is the number of cancerous cells.

RR is the number of treated cells.

β\beta is the rate at which healthy cells become pre-cancerous.

σ\sigma is the rate at which pre-cancerous cells become cancerous.

γ\gamma is the rate at which cancerous cells are treated.

This model can help researchers understand the progression of cancer and evaluate the effectiveness of different treatment strategies. For example, by adjusting the parameters β\beta, σ\sigma, and γ\gamma, researchers can simulate the impact of various interventions, such as chemotherapy or radiation therapy, on the dynamics of cancer cell populations.

Important notes:

- PK data ***usually*** obtained from standard healthy population.
- Patients condition affect PK.
- Alteration in PK parameters may influence directly on pain management.
- The behavior of agonist/antagonist related to a complicated algorithm of concentration in front of receptors.

- Bioavailability
- C max { which compartment}
- Absorbtion
- Distribution & Vd
- Metabolism
- excretion

- TDM?
- Biomarkers?
- Pharmacogenomics?
- Microbiota?
- Inducer/inhibitors(smoking)
- Injectable ER formulations

Gadgets:
eg: like for diabetes:

Prediction
Diagnosis
Monitoring

Great concept:

- Sometimes we need a non-linear method for thinking:
- eg: linear…..biomarker……if….then.
- non linear: change of twitching threshold

Warning: We`re gonna lose the future if