

Case to innovation competition

Medical Innovation Day, Aarhus University

Roche Denmark

Advancements in technology versus evidence based treatment

Precision medicine or personalized medicine can be described as interventions or medicine tailored to the individual patient based on predicted response or risk of disease. An example of this targeted treatment approach is anti HER2 treatment for breast cancer. Although major changes in risk of relapse and overall survival has been achieved since the introduction of this targeted treatment, patients still relapse or die. So knowledge of single mutations does not hold the key for cure, *one size fits all* cannot be applied and a true medical gap still exists.

The inter variability and mutational load differs from patient to patient. Where the mutational load is relatively low in breast cancer, it holds a larger complexity in lung cancer, as seen in the figure below. Genomic profiling and Next Generation Sequencing (NGS) are methods for sequencing genomes at high speed and at low cost. This advancement in technology enables treatment decision making based on genetic mutations. With these technological advancements it has become easier to gain access to the individual patient genomic profile and tailor individual treatment. Ideally, the information will be stored and made available for physicians allowing for continuous optimization in treatment decisions based on previous experience and genetic profile/mutational load from other patients.

However, this new information holds a lot of challenges that needs to be addressed if this new technology will be the new guiding tool in selecting the appropriate treatment algorithm:

1. Does the current setup of the hospitals make sense? Should departments be more focused on treating mutations rather being focused on treating organs
2. Is it feasible to conduct clinical trials in the traditional way? Should approval and usage of medicine be based on real world evidence instead?

3. How will this new personalized information and subsequent treatment decision fit in with current treatment guidelines?
4. How is funding possible when inter variability in patients calls for highly differentiated treatment algorithms?
5. Are there ethical considerations for the treating physicians? Patients?

Ideally, knowledge and usage of this new information will allow for pharmaceutical companies to design precision medicine. This will, ideally, allow patients to have the right medicine at the right time, minimize adverse events and subsequently reduce the economic burden of medicine costs.

Somatic mutation frequencies in different tumors¹

