2020 EIT Health Startups Meet Pharma Challenges

CHALLENGE #1

Pharma partner: Amgen

Title: Encourage continuity in treatment strategy and treatment optimization for post-myocardial infarction patients

Disease Area: Cardiology

Looking for: A solution which will create a standardized procedure for post MI patients after discharge

Description of the challenge

Myocardial infarction (MI) occurs when blood flow decreases or stops to a part of the heart leading to irregular heart beat, cardiogenic shock and, in the worst case, cardiac arrest.

Since the adult mammalian heart has very limited regenerative potential, the loss of cardiac muscle cells due to MI results in a fibrotic scar tissue that causes cardiac dysfunction and heart failure. Therefore, preventing MI in population at risk and in patients who have already experienced an MI episode is extremely important.

High blood cholesterol is one of the major known risk factors associated with MI. Low Density Lipoprotein - Cholesterol (LDL-C), commonly known as " bad" Cholesterol, is a type of blood fat. When the presence of LDL-C in the blood is too high it can lead to the formation of plaques in the arteries, a clinical condition known as atherosclerosis, which eventually can lead to heart attacks.

Therefore, treatment of LDL-C is one of the most important factor for cardiovascular risk reduction. Nonetheless the majority of Health-Care Providers (HCPs) prioritize post-MI patients lifestyle changes (such as stop smoking, diet, exercise) over LDL-C treatment.

Lack of advanced tools for patient risk stratification, no standardized discharge packages and limited information given to post-MI patients are part of a complex post-MI care pathway which leads to suboptimal lipid lowering.

Ideally, we would like to have a) a predictive analytic tool to identify very high risk patients & b) a procedure/tool which will provide a holistic support to post-MI patients after discharge (information for their treatment strategy or lifestyle changes, next steps, link among different type of HCPs).

CHALLENGE #2

Pharma partner: Amgen

Title: Choosing the right treatment for Multiple Myeloma patients

Disease area: Multiple Myeloma

Looking for: Creation of an algorithm, that would help physicians choosing the right treatment for Multiple Myeloma patients

Description of the challenge

Multiple Myeloma (MM) is an incurable disease. The diagnosis consists of CRAB symptoms (C = Calcium (elevated) – hypercalcemia; R = Renal failure, A = Anemia; B = Bone lesions (bone pain)) appearing, and then first line treatment is available (bortezomib or lenalidomide – based). Usually a bone marrow transplantation will follow. But patients relapse soon. Then, it is very difficult to choose the right second line treatment, as guidelines are very open for all available possibilities and no direct head-to head comparison of the newest medical options is available. Therefore, no sequential preferences can be made using only guidelines.

The patient population is small, yet remarkably diverse, requiring intensely personalized treatment. Patients treated with more efficacious treatments early, have a better chance and sometimes (the case in carfilzomib) a better quality of life (fast onset of symptom relief). Different choices also lead to different adverse events, therefore patient characteristics are very important when choosing the right therapy. Multiple myeloma is a disease of the elderly; the median age at diagnosis is 69, with nearly one-third of patients diagnosed at age 75 or older:

- ~20% to 40% of patients with multiple myeloma have some form of renal impairment
- Cardiac comorbidities, impaired lung function, anemia, and bone involvement are common
- Up to 30% of patients have a high-risk unfavorable cytogenetic abnormality. Cytogenetic abnormalities indicate an aggressive tumor type and are associated with poor prognosis. High-risk unfavorable karyotypes include t(14;16), t(4;14), and del(17p).

Therapy of the relapsed/refractory multiple myeloma (RRMM)

ESMO Clinical Practice Guidelines
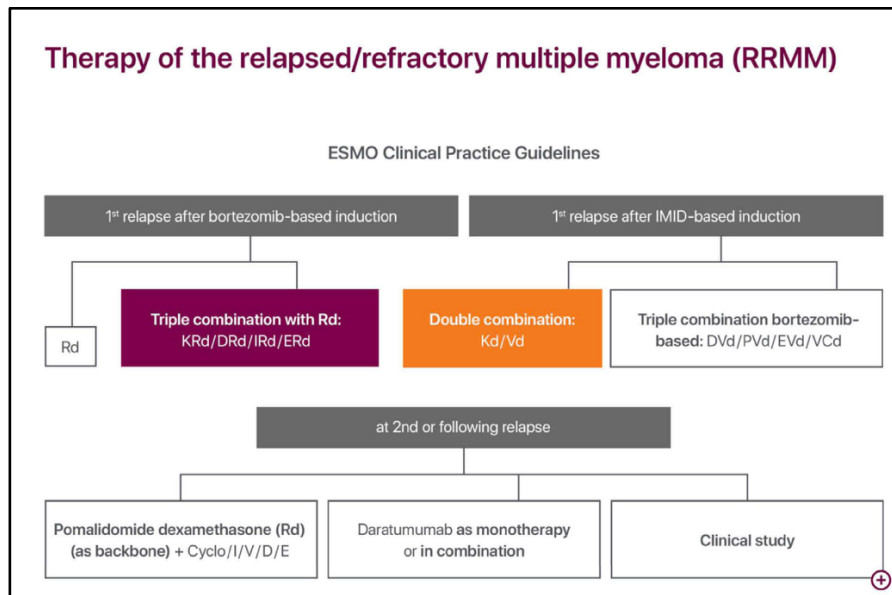
There are 3 novel options available for relapsed MM (for second and further lines):

- Daratumumab – a monoclonal antibody targeting CD38.
- Elotuzumab – a monoclonal antibody, not available in Europe.
- Carfilzomib – a next generation PI inhibitor, very effective, more effective as second line rather than latter lines, targets proteosoma.
- Ixazomib - an oral PI inhibitor, not as effective, but offering convenience of once daily dosing at home, targets proteosoma.

The innovation would have to be in how to make these recommendations (a decision-making tool). If startups can come up with an idea that could use novel technologies to assess the available data or tap into other data that might be available through registries.

CHALLENGE #3

Pharma partner: Bayer AG

Title: Disruptive Gene therapies, cell therapies and delivery technologies for different therapeutic areas

Disease Area: Cardiology, Oncology, Gynecology, Ophthalmology, Hematology and Women's Health

Looking for: Disruptive technologies useful in the therapeutic areas of Cardiology, Oncology, Gynecology, Ophthalmology, Hematology and Women's Health – or ideally for all of those as a platform technology. Breakthrough innovations for other or multiple indications might be of interest as well

Description of the challenge

Specifically, in the area of GENE THERAPY we are looking for:

- Non viral Gene delivery and targeting to specific tissues beyond the liver, e.g. using lipid nanoparticles (LNPs), exosomes, etc...

In the area of CELL THERAPY we are looking for:

- Engineering of Immune cells (e.g. T-Cells, NKT-Cells, NK Cells, Dendritic Cells, etc...) for better tumor penetration and resistance to intra-tumoral immune suppressive effects in solid tumors (immunotherapy using CAR-T like approaches).

In the area of DELIVERY / MANUFACTURING TECHNOLOGIES we are looking for:

- Separate/reduce amount of empty virus particles in scalable Virus (AAV) production process (considering vector design, ITR, protein engineering, chromatography, IEX, HIC, etc...).

For further reference please visit the webpage https://pharma-techscouting.bayer.com/.

CHALLENGE #4

Pharma partner: Beiersdorf AG

Title: Improving the condition of diabetic skin

Disease Area: Diabetes, Skin

Looking for: BioTech, MedTech or Digital Health solutions to improve the condition of diabetic skin

Description of the challenge

We are looking for innovative approaches to treat diabetic skin.

The International Diabetes Federation indicates that more than 415 million adults worldwide have diabetes. It also predicts that by 2040 that figure will rise to 642 million, thereof about 90% are Type 2 Diabetics*.

The disease has far-reaching consequences for the whole body, including the skin. As the body tries to excrete the excess sugar via urine it loses water and skin dries out. In addition, reduced blood circulation and sugar induced skin stress in diabetic patients often lead to difficult skin condition like Xerosis (dry, itchy skin) sometimes followed by secondary bacterial or fungal infections.

Currently most dermocosmetic products designed for diabetic skin relieve the symptoms but do not improve the underlying cause. Emollients, moisturizers and active ingredients like urea, ceramides or NMFs (Natural Moisturizing Factors) help to keep the hydrolipid skin barrier in good order.

We are seeking for solutions which can be directly applied in dermocosmetic products or concepts and target the underlying causes of diabetic skin. Mode of activity can range from improving blood circulation, reduction of AGEs (Advanced glycation end products) and their negative influence on the skin, reduction of itch or beyond.

Proposals may come from the areas of cosmetic / pharmaceutical ingredients, modern formulations, devices, digital approaches to perceivably improve the skin situation of people with diabetes.

*IDF Diabetes Atlas, 5th and 7th ed, 2011 and 2015

CHALLENGE #5

Pharma partner: Boehringer Ingelheim RCV

Title: Portable Interstitial Lung Disease (ILD) Diagnostic Tool

Disease Area: Interstitial Lung Diseases

Looking for: Portable Interstitial Lung Disease (ILD) Diagnostic Tool

Description of the challenge

Interstitial lung disease describes a large group of disorders, most of which cause progressive scarring of lung tissue, which affects patients ability to breathe and get sufficient oxygen into the bloodstream. Primary signs and symptoms include shortness of breath at rest or aggravated by exertion and dry cough. By the time symptoms appear, irreversible lung damage has often already occurred. Nevertheless it's important to see your doctor at the first sign of breathing problems. Getting an early and accurate diagnosis is crucial for proper treatment of ILDs.

The Chest high-resolution computed tomography (HRCT) is currently the method of choice in ILD assessment. However, there is still high unmet need for screening and early diagnosis of ILD patients.

Main challenges are:

Access to HRCT centers is limited in remote – rural areas

If patients do have access, the majority of patients are at advanced stage. This is due to the fact that the symptoms such as cough, shortness of breath and fatigue are nonspecific and commonly associated also with other respiratory diseases.

We are looking for a solution which could potentially help a wider range of Healthcare Professionals especially those in remote areas where access to ILD centers is difficult, to early diagnose ILDs. This tool could help to define the pattern of symptoms and increase the number of diagnosis as well as optimize time of treatment initiation of ILD patients.