

CROSS-INDUSTRY ORGANIZATIONS

Introducing European COST Action—Siminhale

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A definition of COST Actions

European Cooperation in Science and Technology (COST) Actions are science and technology networks that focus on a specific, common research subject. COST Actions are open to researchers and stakeholders and use a range of tools, including workshops, conferences, training schools, short-term scientific missions and dissemination activities. They also assist in fostering the development of early career investigators (ECIs).

This article provides an overview of COST Action MP1404—Simulation & Pharmaceutical Technologies for Advanced Patient-Tailored Inhaled Medicines (Siminhale), which started on May 4, 2015 with the participation of 90 members from 25 countries, as shown in Figure 1. The network will be active for four years.

Challenges for pulmonary delivery

Pulmonary drug delivery is emerging as an important route for administering therapeutic agents for both topical and systemic therapies. With an aging world population in combination with the reduction of health budgets, one of the greatest challenges is to keep the costs of therapy low. To meet these challenges, medication needs to be affordable yet highly

effective and devices have to be easy to operate so that patients are able to comply with correct use and adhere to therapy. These are prerequisites for preventing periodic or permanent exacerbations of pulmonary diseases, which then can lead to greater frequency of hospitalization and thereby, to increased cost of therapy, and may also cause, for instance, development of bacterial resistance against antibiotics. Notably, multi-drug-resistant (MDR) and extensively drug-resistant (XDR) tubercu-

losis (TB), due to inappropriate therapies, are already a huge global concern.

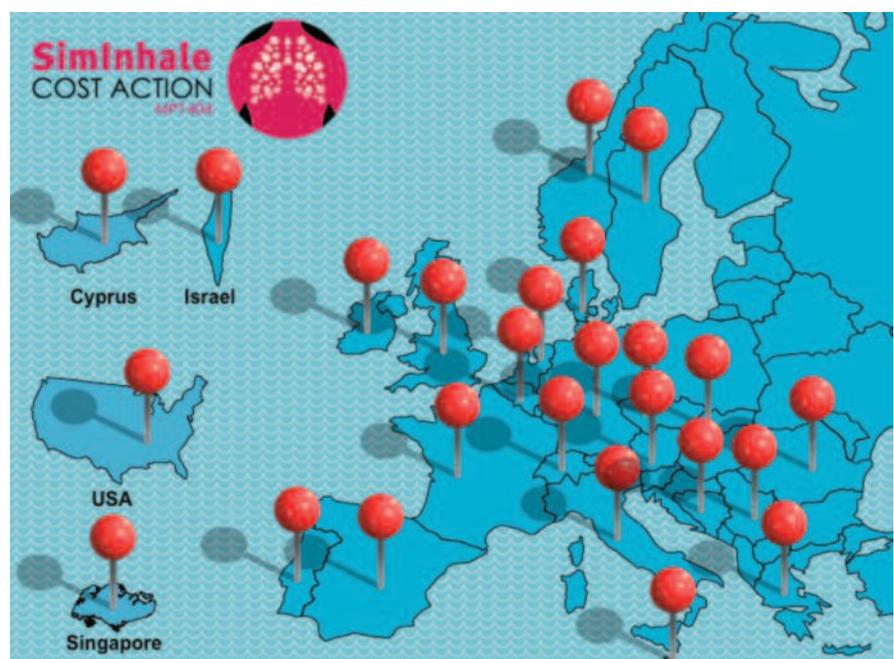
In this respect, the main challenge in relation to inhaled medicines is to overcome technological challenges while keeping manufacturing costs low, drug administration techniques simple and time needed for administration short.

Siminhale's objectives

The main objective of Siminhale is to create and maintain a pan-European

Figure 1

Countries participating in COST Action 1404—Siminhale



multidisciplinary scientific network that will coordinate and enhance research and development with the aim of improving efficiency, safety and convenience of inhaled medicines, as well as to reduce costs of pulmonary drug delivery.

Through the combined expertise of specialists in the fields of particle engineering and formulation development, inhaler engineering and design, integrated computer simulations, advanced imaging, patient monitoring and delivery verification, as well as toxicity, risk assessment and regulation, Siminhale aims at making a new generation of advanced inhaled pharmaceuticals (formulations and devices) available to the public as quickly and cost effectively as possible.

As such, Siminhale is actively promoting the welfare of patients and contributing to European scientific and technological excellence, society and the economy. Its mission is to enable breakthrough scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities. Organized into five work packages, Siminhale intends to integrate fragmented and compartmentalized knowledge in the following areas.

Anticipated benefits and impact

Siminhale will integrate scientific knowledge across disciplines and geographical boundaries in order to accelerate progress and promote synergies. It will enable the flow of information among research groups that are separated by distance, area of expertise or level of experience, thus maximizing the effective use of all available European resources in the field of inhaled medicines. It will disseminate state-of-the-art information across Europe and will bring know-how from across Europe into the mainstream. Siminhale will aim, in particular, at enhancing the interaction between academic research institutions on one hand and industrial

stakeholders and regulatory agencies on the other.

The benefits of the Action will be of scientific and technological, economical and, of course, societal character. Making a new generation of advanced inhaled pharmaceuticals available to patients rapidly and economically will have enormous social benefits. It will also have significant economic benefits because it will advance pharmaceuticals with higher effectiveness and fewer side effects, thus reducing healthcare costs in the long run. It will also help sustain innovation in the industry of inhaled pharmaceuticals and inhaler devices. A list of activities is shown in Table 1.

The Breath of Life Society

A scientific network of early career investigators has been established under the name the "Breath of Life Society." The society will be able to meet separately during Siminhale working group meetings, have its own platform for discussions, table new ideas and suggestions for dedicated tasks, and host training events, workshops, short-term scientific missions, etc. Through the Breath of Life Society, ECIs will have their own voice in Siminhale and a structured platform to promote their active participation in this COST Action. Essentially, the Breath of Life Society will serve as a "think tank" for the ECIs involved in Siminhale.

Upcoming Siminhale events

Siminhale will host a workshop on Integrated Computer Simulations and Advanced Pulmonary Imaging in Prague during October 2016. One aim of the workshop is to showcase some of the leading edge research flowing from Siminhale collaborations. Another is to gather together a number of world experts and provide an opportunity to reach a pan-European audience of experts. A third objective is to have a panel discussion on the challenges and opportunities lying ahead in the field. In February 2017, Siminhale will present a Training School on Particle Engineering and Integrated Formulation and Device Development. During the training school, Siminhale will host several world leaders in the field who will give extended lectures aimed at the members of the Breath of Life Society. Details for both events will become available on the Siminhale website.

Siminhale's social media contacts

For more information, please visit the following social media: the Siminhale website: www.siminhale-cost.eu; the COST Association website: www.cost.eu; LinkedIn: www.linkedin.com/groups/8421105; and Facebook: www.facebook.com/siminhale.

Table 1

Activities Covered by Siminhale

Advance particle and compound design for improved deposition and therapeutic effect.

Promote integration of particle/formulation engineering with inhaler design for optimal lung delivery.

Promote drug-property awareness and drug-target awareness in design and development of pulmonary drug delivery systems.

Explore imaging technologies for patient monitoring, delivery verification and simulation validation.

Promote critical assessment of toxicity issues and related risks.

Identify new applications and needs, and evaluate and explore innovative technologies relevant to the field and publish critical reviews.

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