"High Efficiency Inhalation Device Delivering Reproducible Dosing to the Lungs" VCU #07-54

VIRGINIA COMMONWEALTH UNIVERSITY

Applications

- Treatment of respiratory disease, systemic disease, acute pain
- Delivery of next generation medicines (proteins, peptides, nanoparticles)
- Gene therapy

Advantages

- Noninvasive
- Clean technology (no excipients)
- Reproducible dosing
- Virtually zero deposition in mouth or throat
- More medication retained in the lungs

Inventors

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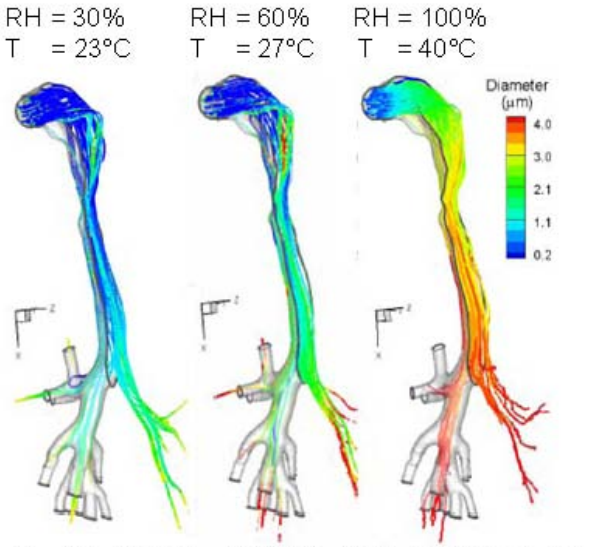
Market Need

Pulmonary drug delivery, which has been used for many decades to treat respiratory disorders, offers the potential for noninvasive administration of a wide variety of medications. Nearly every biotherapeutic product that treats chronic or long-term illness would benefit from noninvasive delivery. One drawback of pulmonary drug delivery is the inability to control the amount of medication delivered to and absorbed by the lung. Only about 5-20% of the medication is actually delivered to the lung, the remainder is deposited in the mouth and throat and subsequently swallowed. This may be acceptable when delivering drugs that have high potencies and large therapeutic windows like those to treat asthma, but could be a problem with next generation drugs such as peptides, proteins, and genes.

Technology Summary

This is a novel inhalation device that changes the size of the particles of medication as they are inhaled, resulting in a decreased percentage of medication deposited in the mouth and throat and an increased amount of particles delivered to the lung. This device could greatly enhance the effectiveness of pulmonary drug delivery.



As the relative humidity (RH) increases the particles in the deep lung "grow" to a size that is more readily absorbed in the deep lung.

Technology Status

U.S.Patent pending: 12/866,869

Comprehensive proof of concept studies completed.

This technology is available for licensing to industry for further development and commercialization.