Systems And Methods For Therapeutic Agent Delivery

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SUMMARY

UCLA researchers at the Department of Physics have developed a system that is capable of delivering a therapeutic agent to a specifically targeted tissue using ultrasound.

BACKGROUND

Soft tissue infections are a major global health issue. About 325,000 new cases are diagnosed each year. When an inadequate concentration of antibiotic is used to treat a given infection, antibiotic resistant strains of bacteria develop that are increasingly difficult to treat. Patients with MRSA cellulitis of the lower extremity, especially those with impaired circulation, such as diabetes, are even more difficult to treat with standard delivery methods of antibiotics such as oral or intravenous administration. At times, oral and intravenous administration of antibiotic cannot deliver adequate concentration of antibiotic to the target tissues. Consequently, over 10% of these cases end up in amputation, and over $25 billion is spent annually on chronic wounds.

INNOVATION

Researchers at UCLA developed a system that uses ultrasound to deliver a therapeutic agent in a solution to a target tissue. The user can be input parameters into the system to control the amount of therapeutic and ultrasound energy delivered to the patient. The system also contains a sensor which can be used during treatment to monitor and adjust therapeutic output based on changes in acoustic response.

APPLICATIONS

- Ultrasonic delivery of therapeutic agents: soft tissue infection (MRSA), cancer, colonization, inflammation

ADVANTAGES

- Allows for specific delivery of drug to targeted tissue at adequate concentration
- May reduce side effects associated with systemic delivery
- Input parameters ensure that patient will not be overdosed
- Sensor allows monitoring and calibration of treatment

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,129977	09/27/2021	2016-294
United States Of America	Issued Patent	10,258,782	04/16/2019	2016-294
United States Of America	Issued Patent	9,956,388	05/01/2018	2016-294

RELATED MATERIALS

- Silberg, Barry Neil. "Protecting exposed tissues with external ultrasonic super-hydration." Aesthetic Surgery Journal 26.2 (2006): 230-232.
- Silberg, Barry N. "The technique of external ultrasound-assisted lipoplasty." Plastic and reconstructive surgery 101.2 (1998): 552.

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OTHER INFORMATION

KEYWORDS

therapeutic, delivery system, device, antibiotic, MRSA, cancer, colonization, inflammation, therapy, drug, ultrasound, infectious disease, ultrasonic

CATEGORIZED AS

- **Medical**
  - Delivery Systems
  - Devices
  - Disease: Cancer
  - Disease: Infectious Diseases
  - Therapeutics

RELATED CASES

2016-294-0

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