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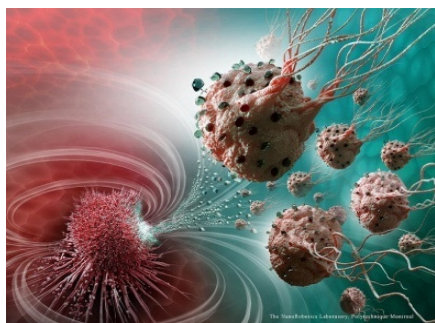
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These bacteria, led to a tumour using a programmed magnetic field, burrowed deep within to “find” the hypoxic zones. The researchers attached drug vesicles to each bacteria cell, and 55% of the injected bacterial cells made it to the tumour. Normally, only about 2% of drugs make it inside."The ability to actively and precisely target drug delivery to a tumour will help reduce side effects and potentially improve the efficacy of treatments."

**Ref:** <http://www.fiercepharma.com/drug-delivery/magnetic-driven-bacteria-get-drugs-deep-into-tumors>



# PHARMAPEDIA

## PSGCP *E-News Letter*

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### Enteric capsule technology

Through the blend of polymer science and capsule engineering, Capsugel has developed a line of functional capsules that provides the industry with a viable alternative to achieve enteric protection and delayed release without functional (enteric) coating.

Vcaps® Enteric is a fully compliant capsule technology that can simplify and accelerate the development of drug products requiring enteric protection and/or delayed release. By removing the need for enteric coating, intrinsically enteric capsule technologies also offer tremendous potential in early-stage product development, and can be utilized to greatly simplify formulation and process development, as well as scale-up and validation. Vcaps® Enteric is a two piece hard enteric capsule manufactured with pharmaceutical grade hydroxypropylcellulose acetate succinate and hydroxypropylcellulose.

**Ref:** <http://www.capsugel.com/biopharmaceuticals/design/targeted-delivery/delayed-release-and-enteric-protection/vcaps-enteric-primary/>

### Magnetic Bacteria- as Nanorobotics

Researchers at the Polytechnique Montreal NanoRobotics Laboratory have found that a bacterium called *Magnetococcus marinus* which lives in deep waters with little oxygen, imbued with magnetic capabilities can be a way to deliver targeted loads of chemotherapy to tumours with fewer side effects. The bacteria have adapted to the environment with magnetic nano crystals that act like a compass guiding them north, as well as oxygen sensors that lead them to the deeper waters. Many nanocarriers reach a tumour via the circulatory system to disburse their payloads, but this kind of passive delivery doesn't allow them to penetrate a tumour in a way that some of the tumours' most active parts remain intact. These are the tumours' hypoxic zones and are thought to be the source of metastasis, and they are also known to have less oxygen than surrounding areas.

## Making skin 'leaky' to improve drug delivery:

To make skin leaky, the structures between the cells in the stratum corneum have to be disrupted, without damaging the cells. Scientists in Japan (Yella Hewings, Martin, Marius Blajan-Shizuoka University) have been working to disrupt the impermeable stratum corneum by treating with atmospheric microplasma. Plasma can be produced by partial ionization of a gas. When plasma is generated in a very small space, covering only micrometer distances, it is termed microplasma.

Microplasma treatment resulted in leaky skin, and thus has a future in transdermal drug delivery.

Ref: <http://www.medicalnewstoday.com/articles/313981.php>

## Artificial Intelligence and the future of pharma industry:

Computers with learning capabilities, such as IBM Watson, are capable of interpreting millions of pages of scientific literature and data of clinical trials, discovering previously unknown connections between diseases and make an assessment within few minutes to assist pharma companies in development of new drugs.

IBM Watson Health and Pfizer Inc. announced a collaboration that will utilize IBM Watson for Drug Discovery to help accelerate Pfizer's research in immuno-oncology. [Berg](#), a fast-growing Boston biotech, uses artificial intelligence to find and validate disease-causing biomarkers and efficiently craft therapies based on the newly found data.

Ref: <https://www-3.ibm.com/press/us/en/pressrelease/51149.wss>

<http://www.drugtargetreview.com/news/15400/artificial-intelligence-drug-discovery/>

<http://medcitynews.com/2015/07/berg-artificial-intelligence/>

### The Beautiful old.



Portable enema self administration apparatus used in 18<sup>th</sup> century



Ancient Tincture Press

### Dosage form Update

U.S.FDA approved Vermox Chewable Tablet (**Mebendazole**) 500mg for Treatment of Children and Adults with Roundworm and Whipworm Infections.

U.S.FDA approved Carnexiv<sup>TM</sup> (**carbamazepine**) injection as intravenous replacement therapy for oral carbamazepine formulations

## Who Am I???

1. When I pair up with some like me I dissolve a solute. Who am I?
2. He controls you and I protect him. Who am I?
3. I am someone who provides optimum UV protection for those who hate light. Who am I?
4. I'm the most important person in this field and people require me for every query they have. Who am I?
5. I'm composed of ferromagnetic particles and I travel through narrow roads with the help of magnets. Who am I?

## Find me if you can – Crossword

M	I	N	S	I	T	U	G	E	L
V	M	O	N	O	G	R	A	P	H
A	T	R	I	P	S	Y	C	H	O
C	N	A	H	T	A	L	G	A	E
C	E	T	C	A	N	C	E	R	N
I	T	X	N	I	O	S	O	M	E
N	A	L	E	A	N	R	W	A	I
E	C	O	D	E	I	N	E	S	Q
S	P	I	S	H	E	L	L	A	C

### Clues:

1. Bio data of a drug
2. Sol to gel
3. Resin secreted by the female lac bug
4. Protects an invention
5. Vesicular drug delivery system
6. Abnormal cell growth
7. Agreement on standards for Intellectual property rights
8. Aquarium gunk
9. Anti-tussive obtained from opium
10. Biological preparations to improve immunity

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