Microorganisms in the Treatment of Cancer

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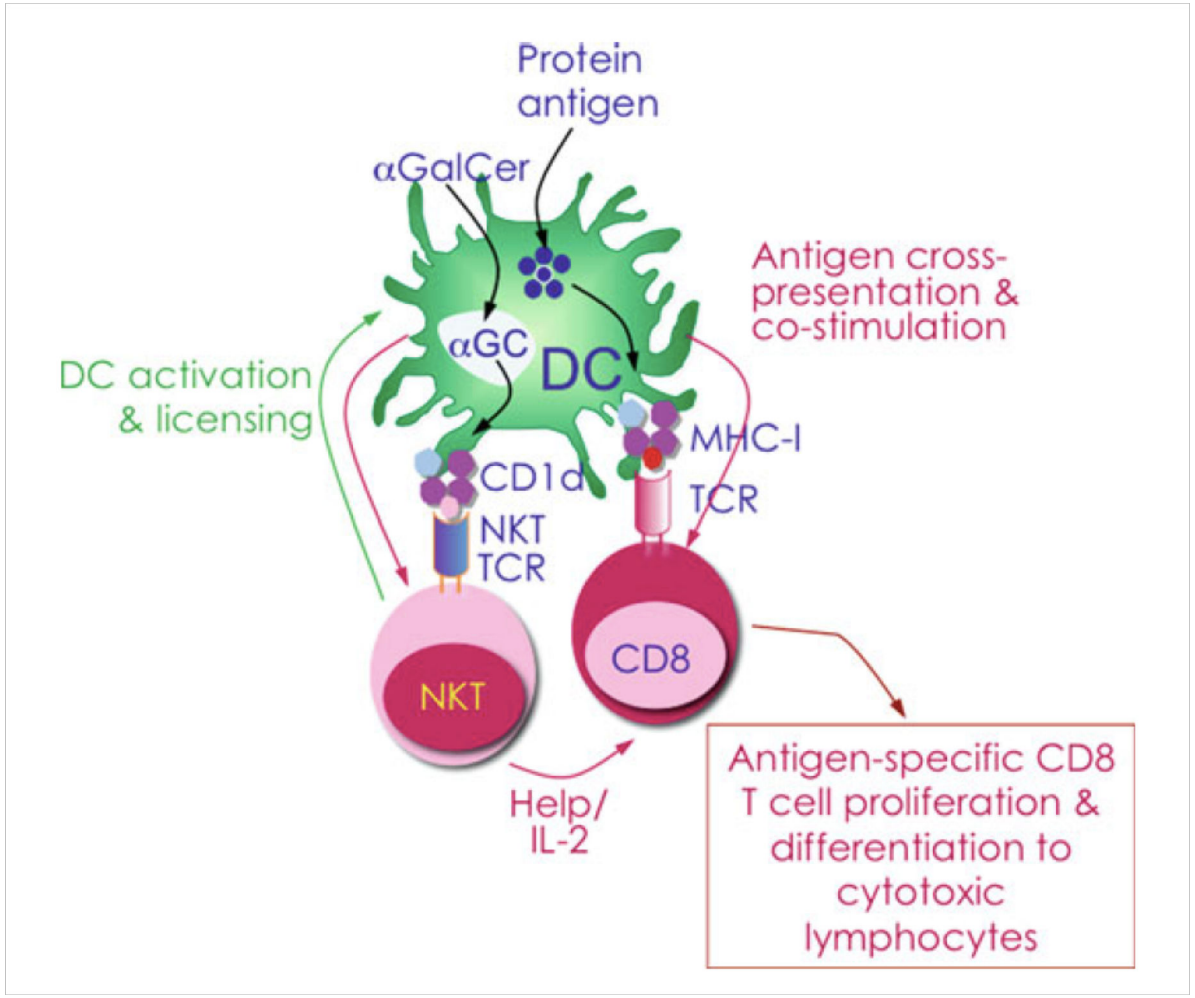
SC30253 Biotechnology (2/2018)

Cancer Treatments

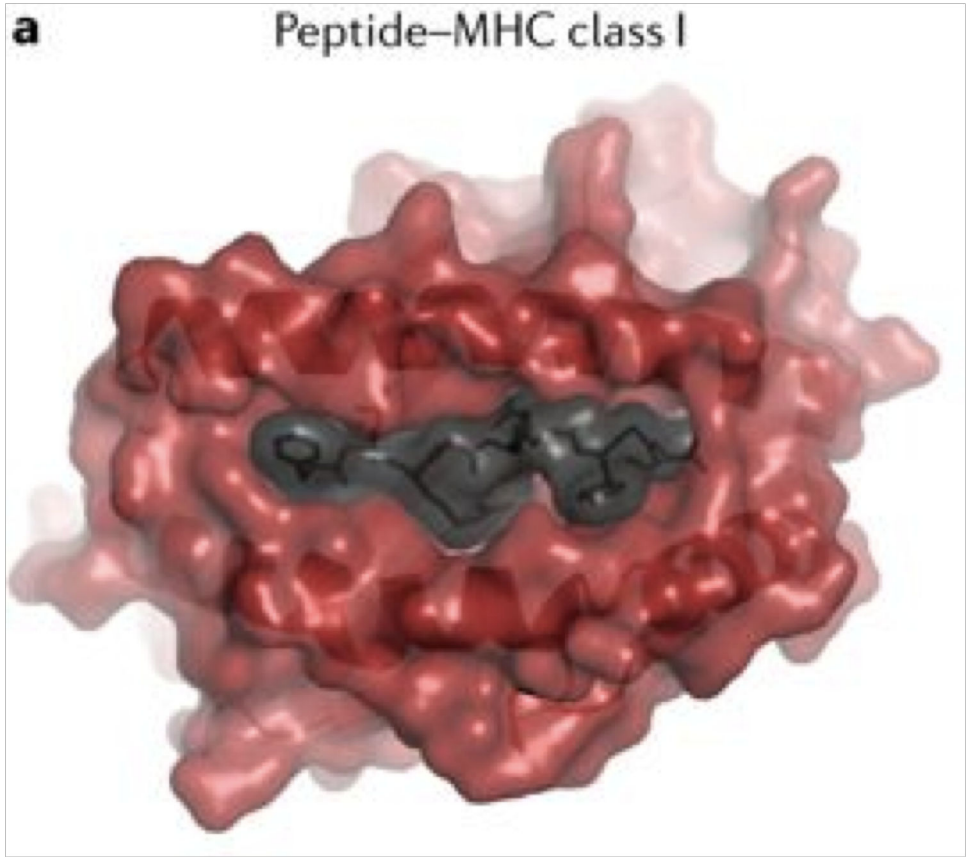
Image Source : www.cancer.gov/about-cancer/treatment/types/precision-medicine

Mechanism types of microbes for cancer treatment

- As a drug carrier
- As a immune stimulant



Source : Christopher B. Fox(2016), Vaccine Adjuvant



Peptide (black stick and surface) in complex with an MHC class I molecule (red surface)

Source : La Gruta, N., Gras, S., Daley, S., Thomas, P. and Rossjohn, J. (2018). Understanding the drivers of MHC restriction of T cell receptors. *Nature Reviews Immunology*, 18(7), pp.467-478.

Antitumor Activity of a *Streptococcus pyogenes* Preparation (OK-432). I. Sequential Effector Mechanisms Following a Single OK-432 Injection in F344 Rats Leading to the Rejection of Syngeneic MADB106 Tumor Cells [1,2,3]

Hiroyasu Fukui [4,5] *and* **Craig W. Reynolds** [4,6,7]

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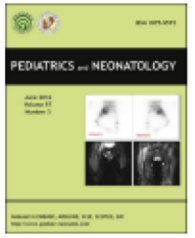

CASE REPORT

Complete Resolution of Retroperitoneal Lymphangioma with a Single Trial of OK-432 in an Infant

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New Treatment Options for Lymphangioma in Infants and Children

Chantal M. Giguère, MD, Nancy M. Bauman, MD, Richard J. H. Smith, MD

First Published December 1, 2002 | Research Article
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Article information

Altmetric 3

Abstract

Lymphangiomas are congenital malformations of the lymphatic system. These lesions occur most often in the head and neck area, and their treatment continues to be a challenge. Fortunately, a number of advances have occurred in the diagnosis and management of lymphatic malformations in the past decade. The purpose of this article is to clarify the embryology, pathogenesis, histopathology, and classification of these lesions, as well as to describe their various forms of clinical presentation. We provide a complete review of the diagnostic measures available and thoroughly discuss new therapeutic interventions proposed to treat lymphangiomas.

Keywords

cervicofacial malformation, congenital malformation, cystic hygroma, head and neck tumor, lymphangioma, lymphovenous malformation, OK-432

OK-432 (Picibanil)

- Immunostimulant, lyophilized mixture of a low-virulence strain (Su) of group A Streptococcus pyogenes incubated with penicillin G.

Streptococcus pyogenes

Source : Wikipedia

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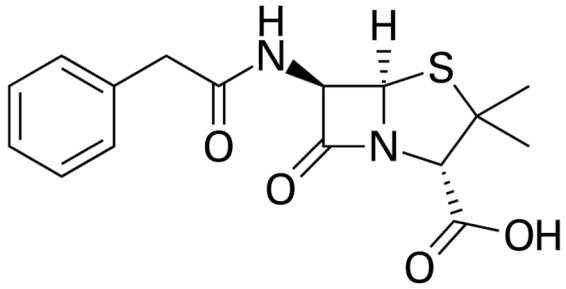


Benzylpenicillin
(penicillin G)

Lyophilisation

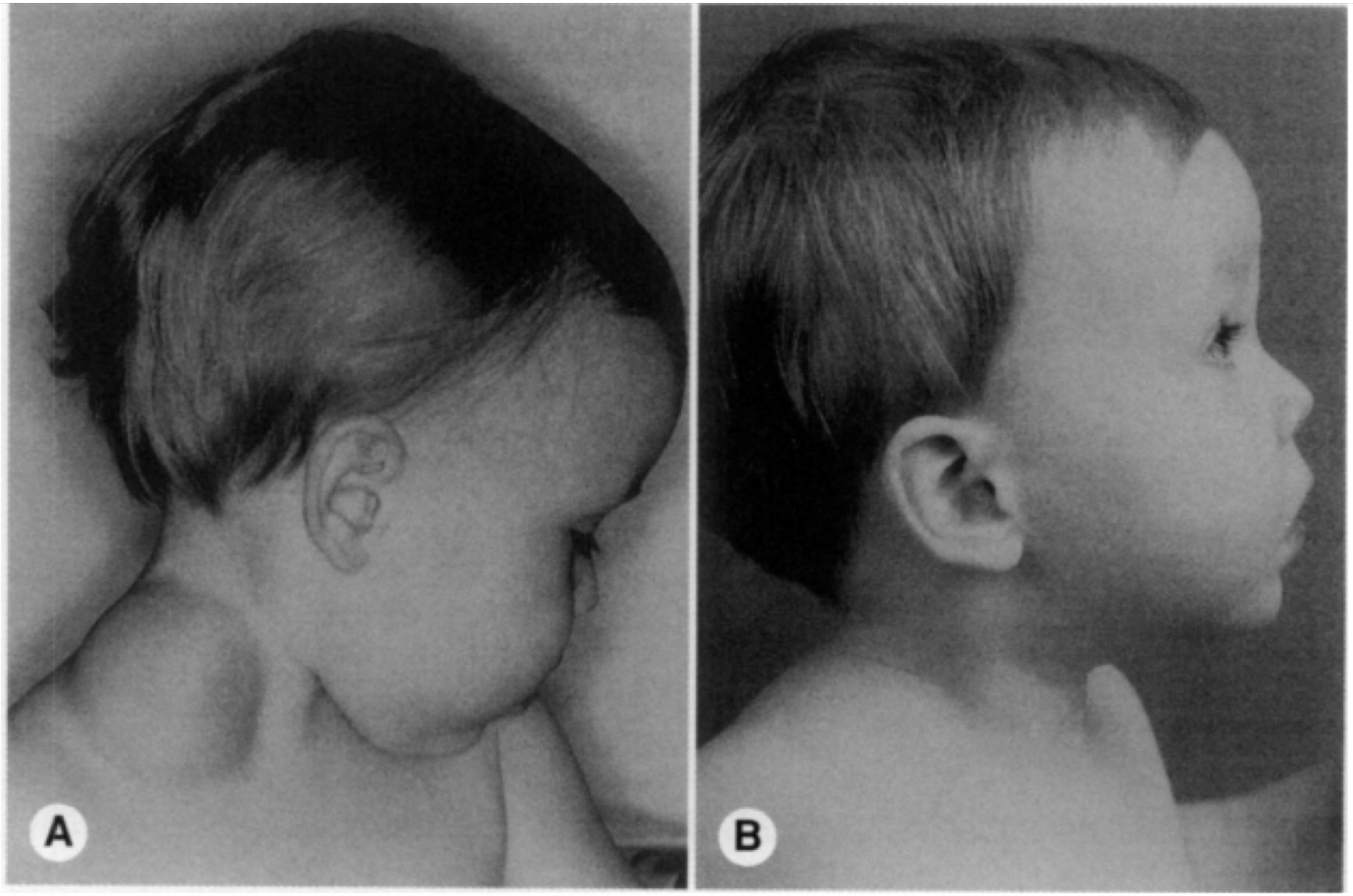
Inactive Ingredients

OK-432

http://fund-ogita.org/file/PackageInsert_English.pdf

Lymphangiomas

Fig 1. Patient with stage I lymphangioma of right side of his neck. Photographs taken **A)** before and **B)** after 1 injection of OK-432 demonstrate complete response to this treatment.

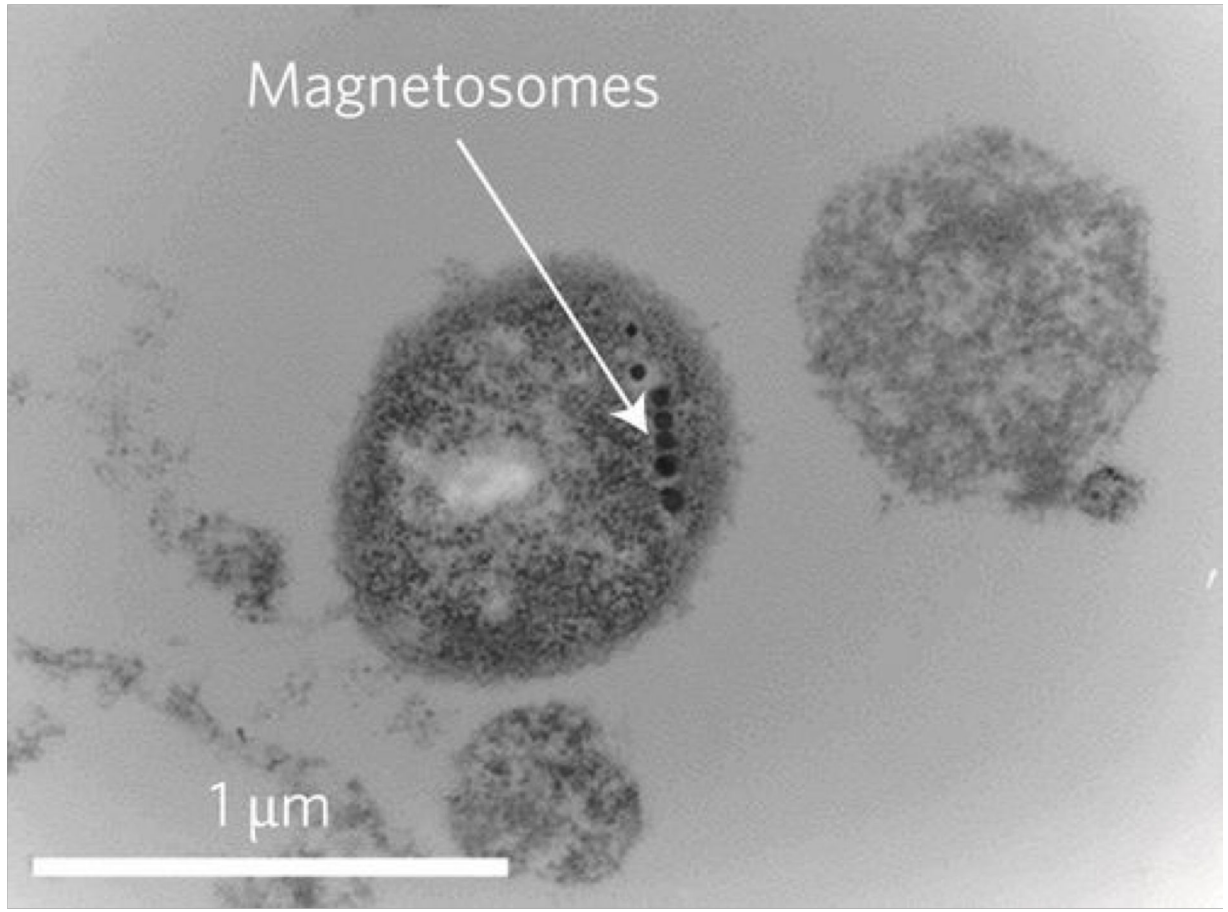


La Gruta, N., Gras, S., Daley, S., Thomas, P. and Rossjohn, J. (2018). Understanding the drivers of MHC restriction of T cell receptors. *Nature Reviews Immunology*, 18(7), pp.467-478.

Magneto-aerotactic bacteria deliver drug-containing nanoliposomes to tumour hypoxic regions

Ouajdi Felfoul, Mahmood Mohammadi, Samira Taherkhani, Dominic de Lanauze, Yong Zhong Xu, Dumitru Loghin, Sherief Essa, Sylwia Jancik, Daniel Houle, Michel Lafleur, Louis Gaboury, Maryam Tabrizian, Neila Kaou, Michael Atkin, Té Vuong, Gerald Batist, Nicole Beauchemin, Danuta Radzioch & Sylvain Martel ✉

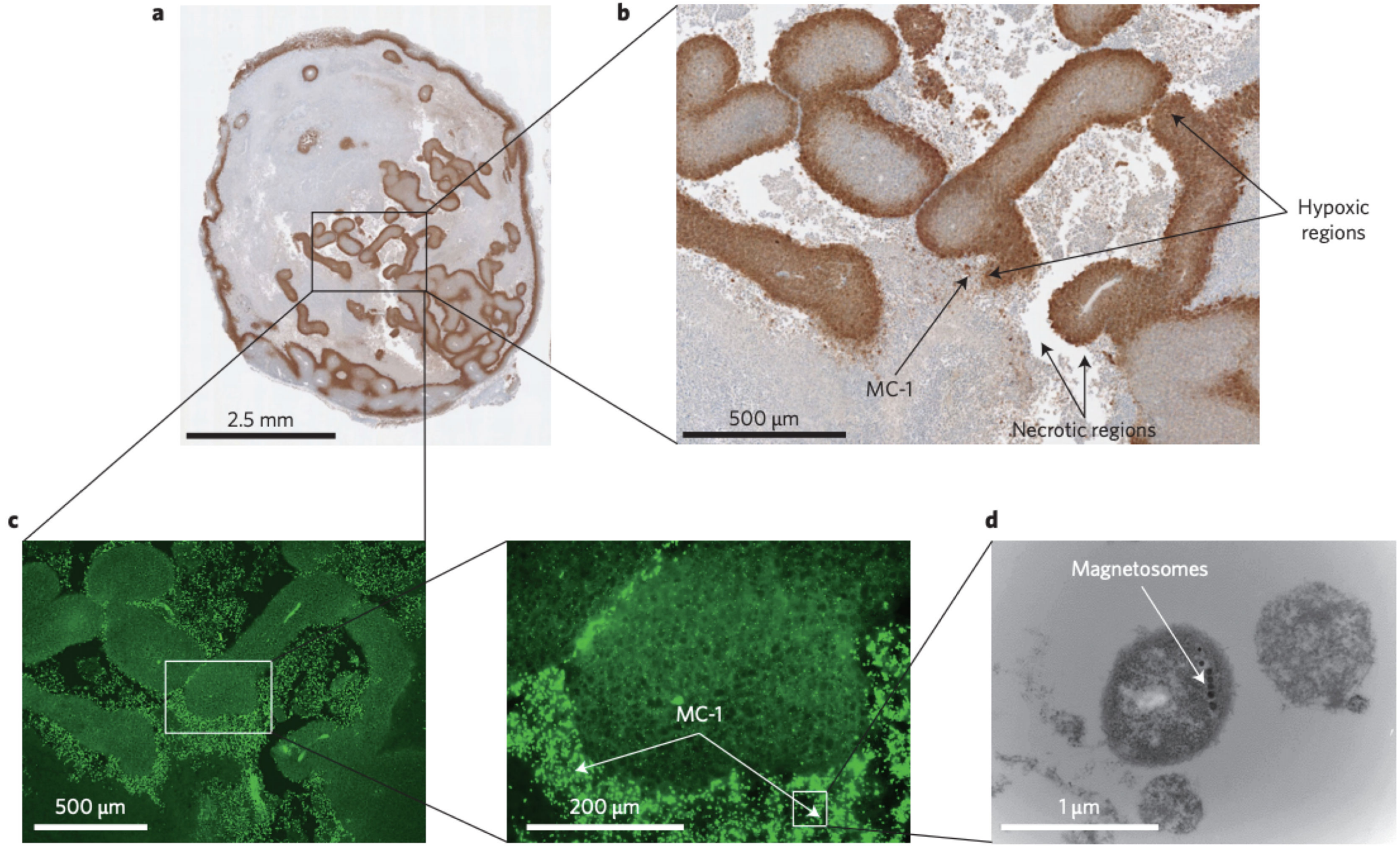
Nature Nanotechnology **11**, 941–947 (2016) | Download Citation ↓



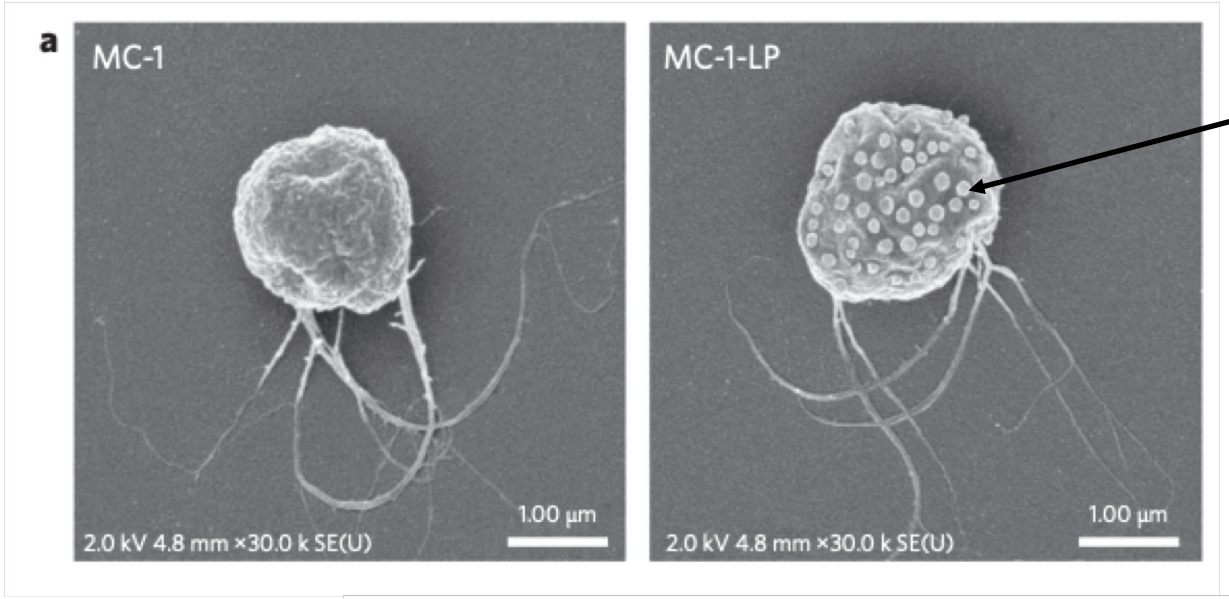
Magnetococcus marinus MC-1

Magnetosome are membranous structures present in magnetotactic bacteria (MTB). They contain iron-rich magnetic particles that are enclosed within a lipid bilayer membrane. (Wikipedia)

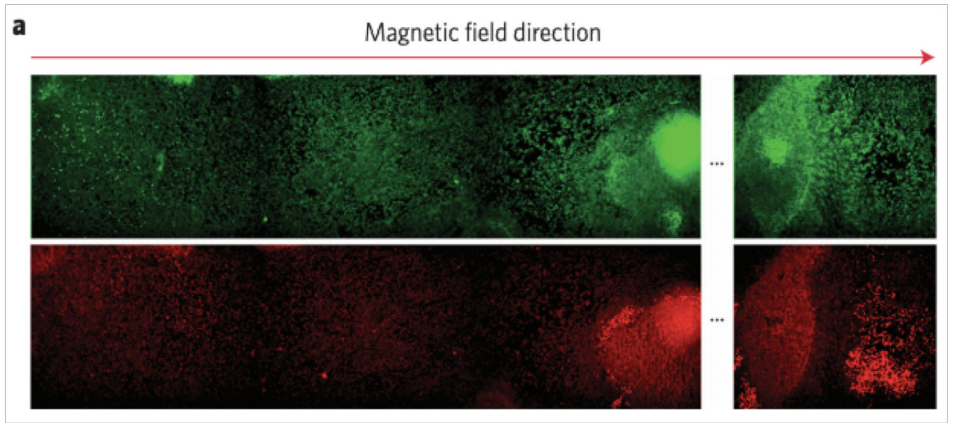
Source : microbewiki.kenyon.edu/index.php/Magnetococcus_marinus_MC-1

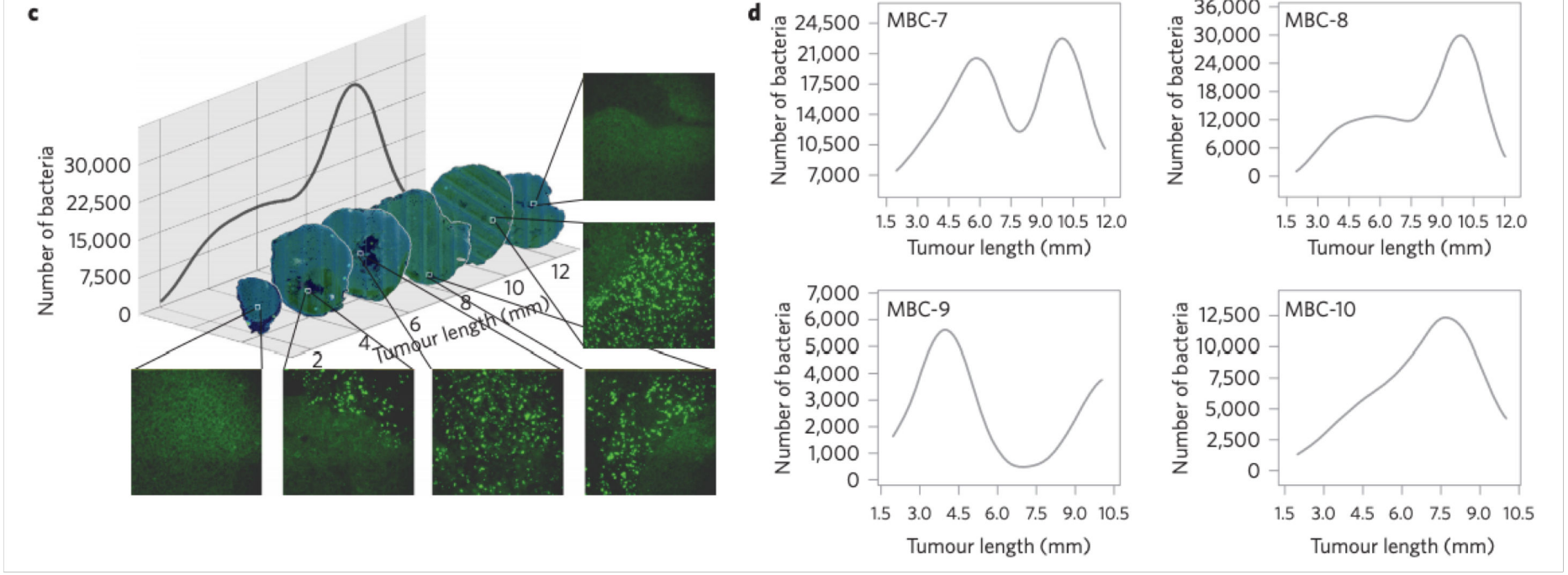


Felfoul et al., 2016



Liposome with drugs





Felfoul et al., 2016

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