

Non Communicable Diseases: Globalizzazione dell'Alimentazione, Malattie Umane ed Animali

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***Giornate Catanesi di Nutrizione Clinica -
VI Edizione***

***Collaborative Problem Solving in Nutrizione Clinica,
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Toward 10 Billion

New projections by the United Nations suggest the world's population may surpass 10 billion by 2100 — with Asia and Africa far and away the most populous regions.

6 billion people

4

2

0

WORLD POPULATION

MIDRANGE PROJECTIONS

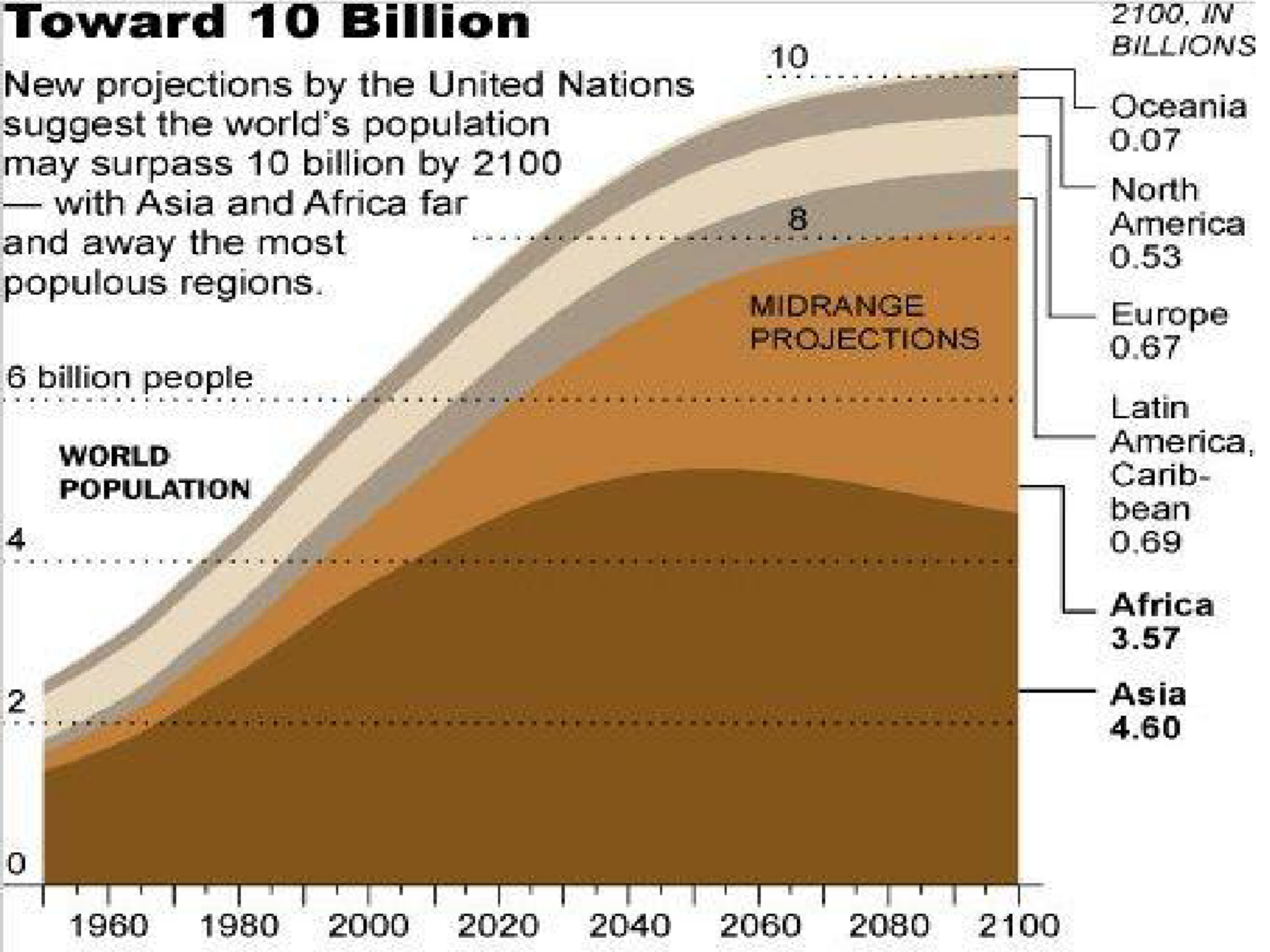
10

8

2100, IN BILLIONS

- Oceania 0.07
- North America 0.53
- Europe 0.67
- Latin America, Caribbean 0.69
- Africa 3.57
- Asia 4.60

1960 1980 2000 2020 2040 2060 2080 2100



Global warming

2015-2021: I 7 anni più «caldi» finora registrati sul nostro Pianeta nel corso degli ultimi 140 anni, con particolare riferimento all'*annus horribilis* 2020 (*Nature*)

Emerging Infectious Diseases (EIDs)

Arthropod-Borne Infections

Global warming

Gas-serra, desertificazione, incendi, deforestazione e relativi effetti sulle «interfacce ecologiche» fra specie animali selvatiche, domestiche e uomo

Emerging Infectious Diseases (EIDs)

Emerging Infectious Diseases (EIDs)

**70% e piu' originanti da uno o più (comprovati o sospetti)
«serbatoi animali»
(*spillover vs spillback*)**

SARS-CoV, MERS-CoV, SARS-CoV-2

«More plastic than fish in the sea by 2050»

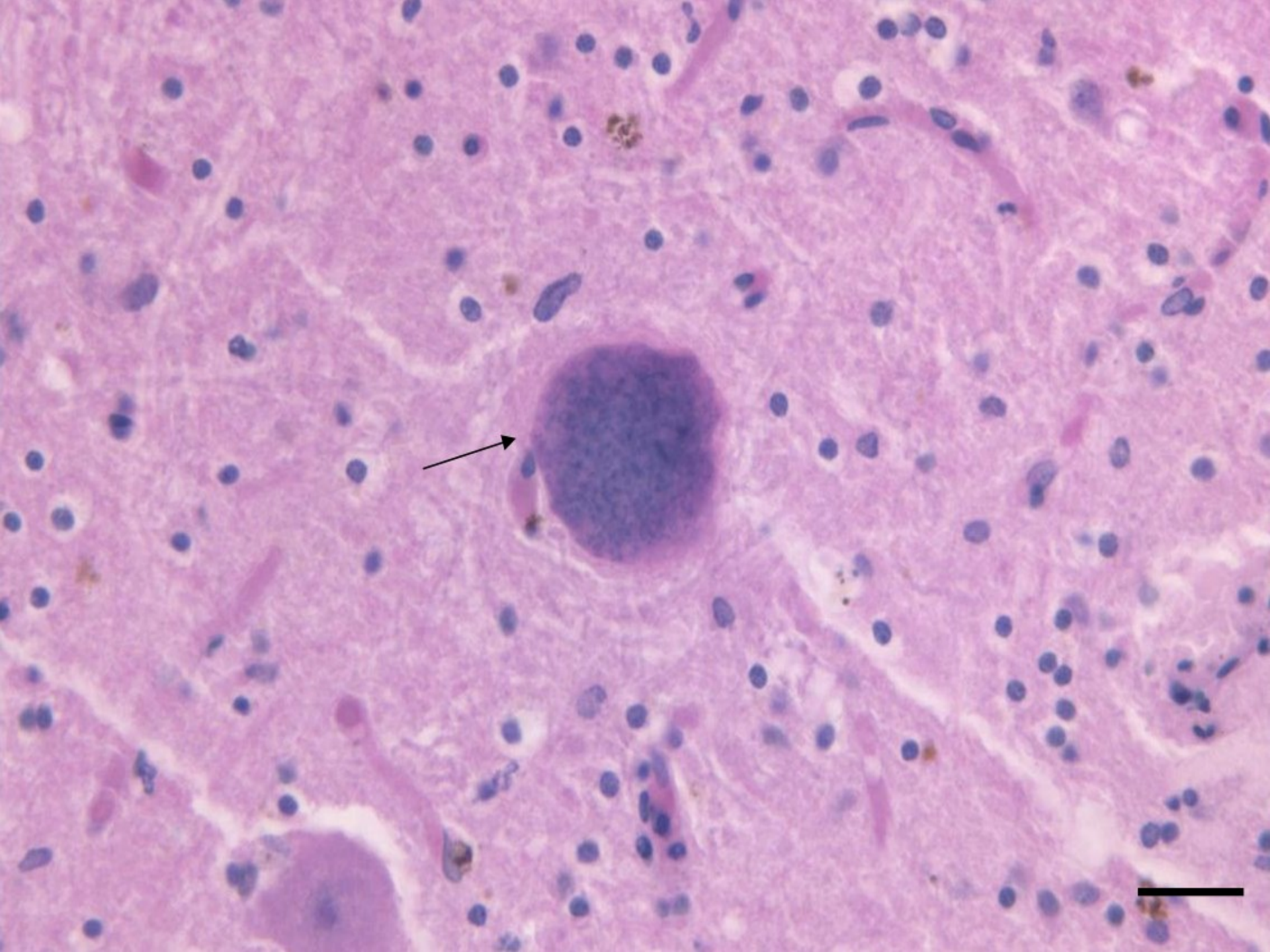
(World Economic Forum Report, 2016)

Micro-nanoplastiche ed organismi invertebrati (*Toxoplasma gondii* ed altri agenti patogeni?) (Carlton *et al.*, *Science*, 2017; Di Guardo & Mazzariol, *Science*, 2017)

Mascherine e contaminazione degli ecosistemi marini da micro-nanoplastiche (Di Guardo, *BMJ*, 2020; Einfeld-Pierantonio *et al.*, *Environ. Poll.*, 2022)

Still within 2050, 15-40% of all the species living in our Planet could become extinct

(Thomas et al., Nature, 2013)



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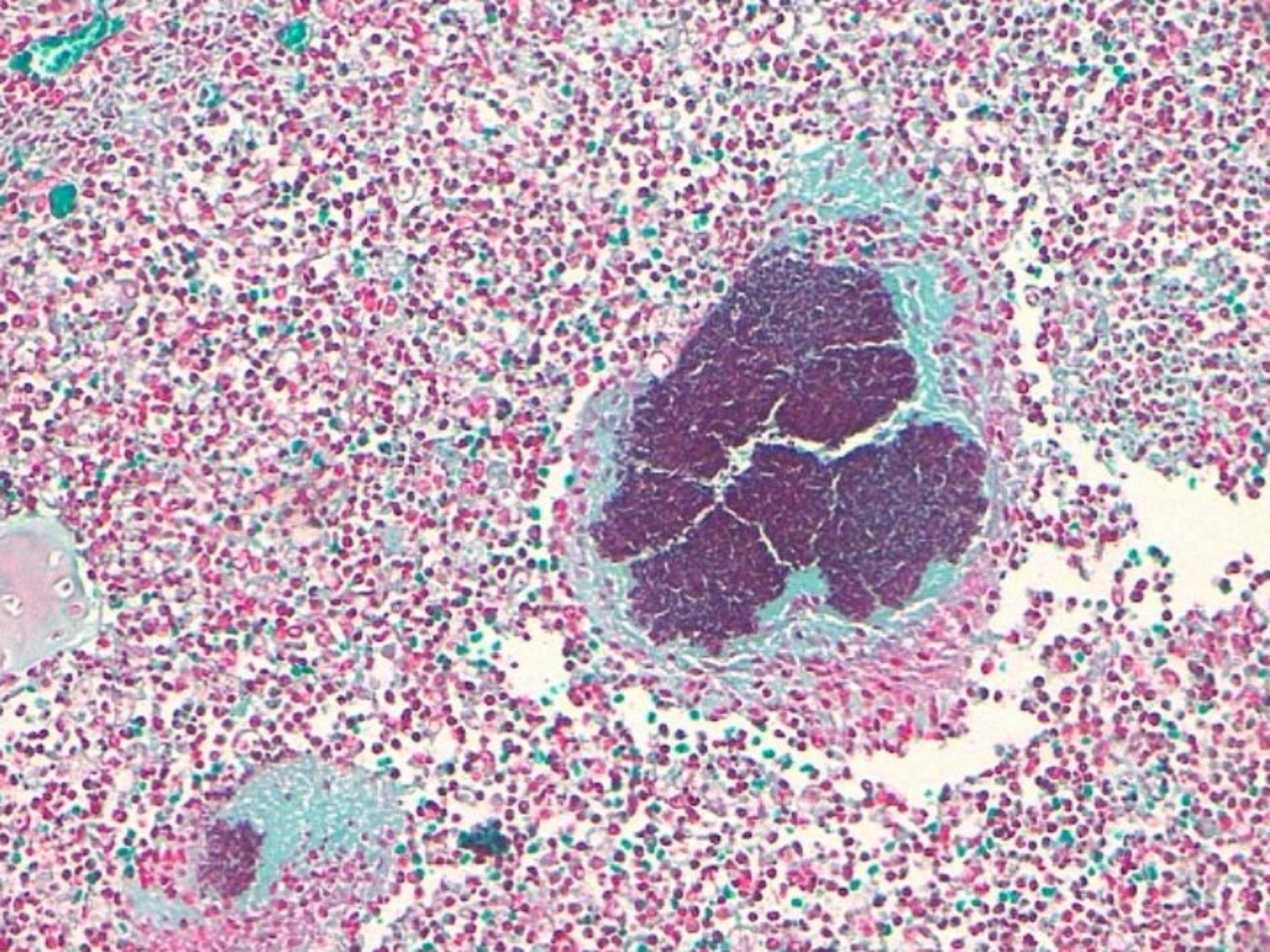


Inquinamento globale: 7-9 milioni di morti/anno

(Lancet, 2017)

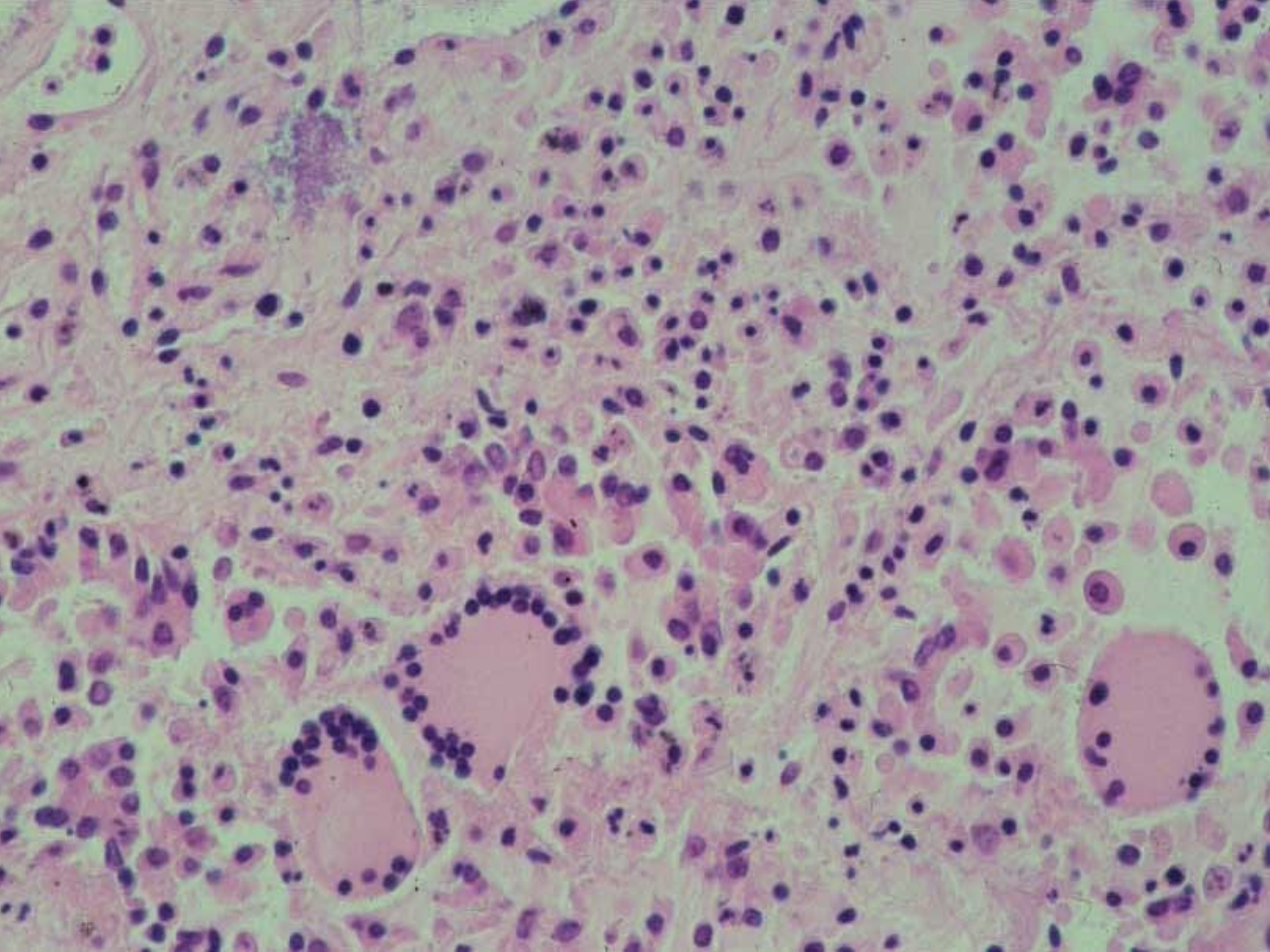
Resistenza antimicrobica/antibiotico-resistenza: 1.200.000 decessi su base annua per infezioni da microorganismi antibiotico-resistenti, 10.000 dei quali in Italia (primo Paese in Europa)

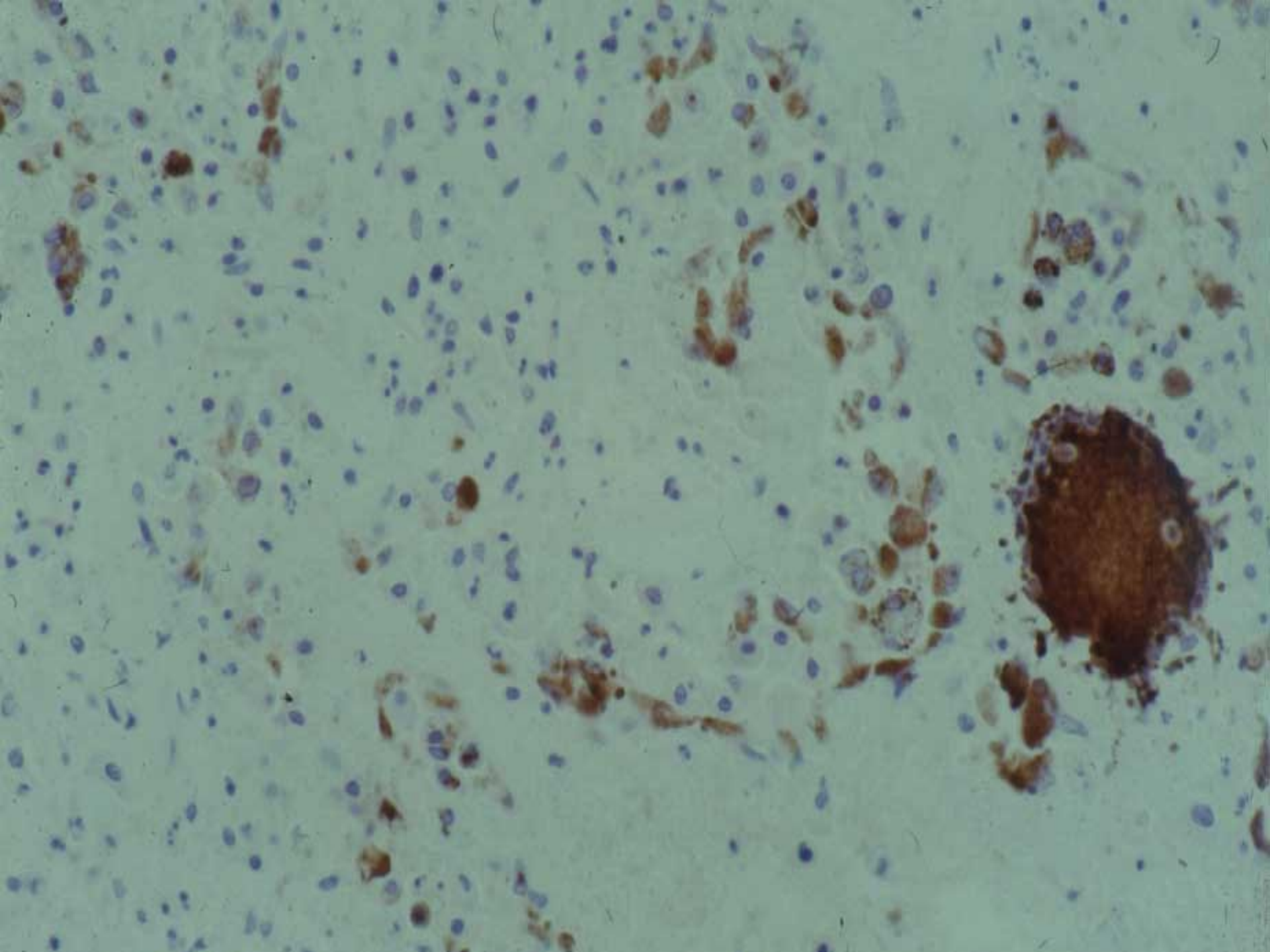
Trasferimento geni/caratteri di antibiotico-resistenza lungo le catene trofiche marine ed al microbiota commensale



***Animal Diseases and
Animal Models of Human
Diseases***

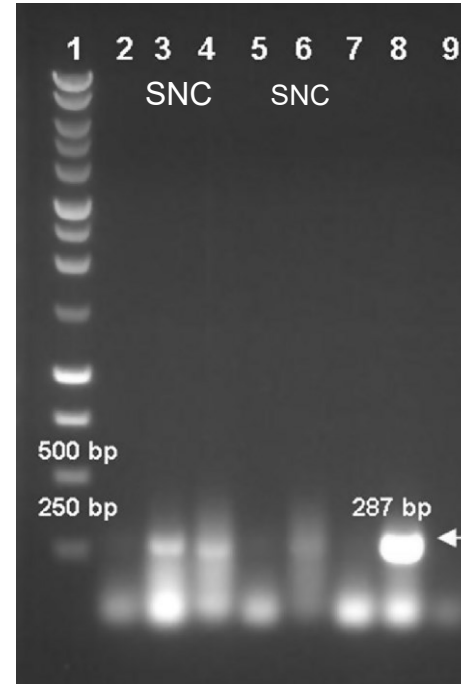
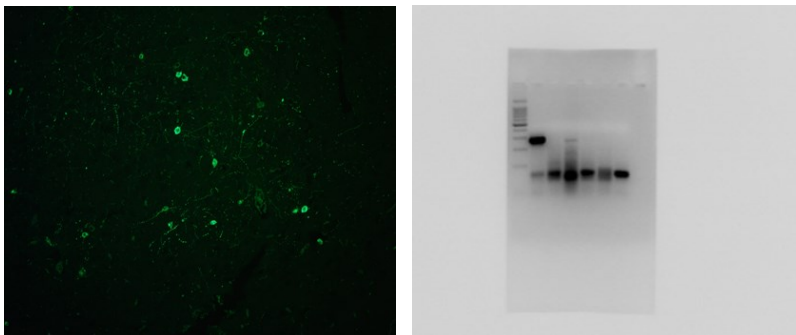
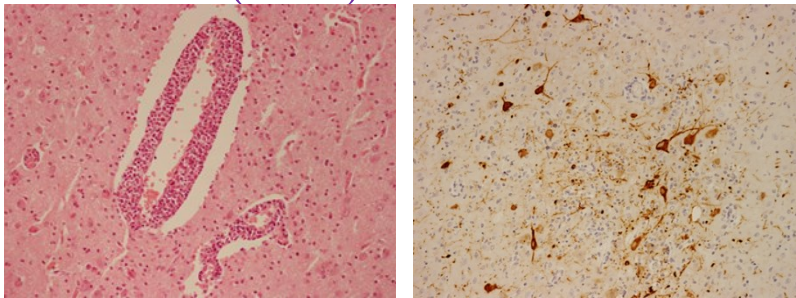
Communicable Human and Animal Diseases





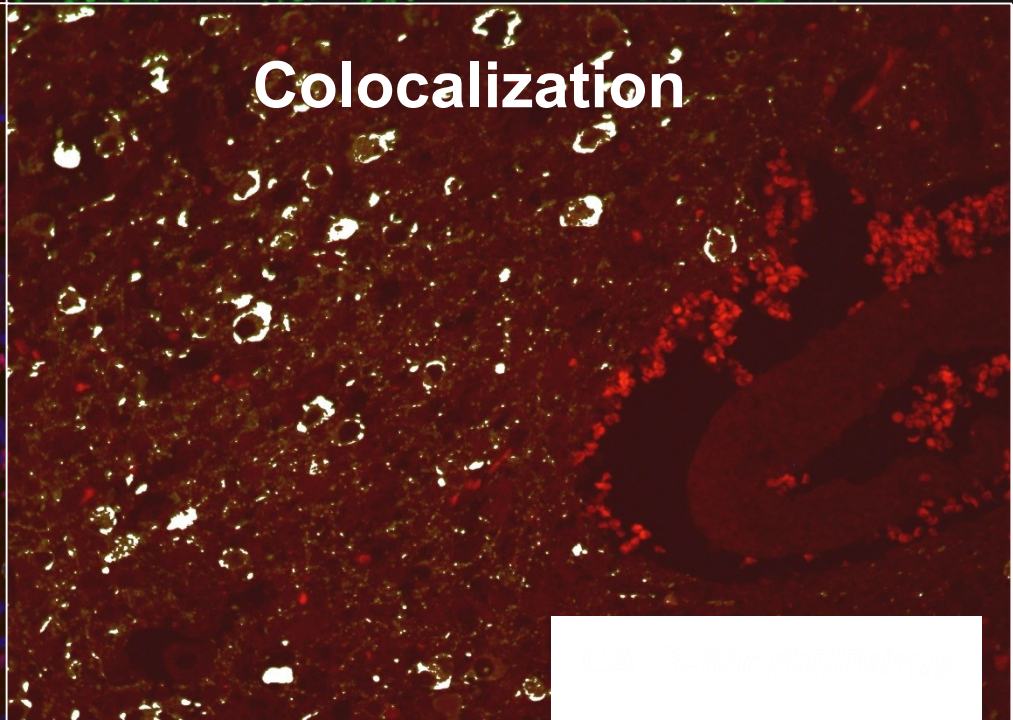
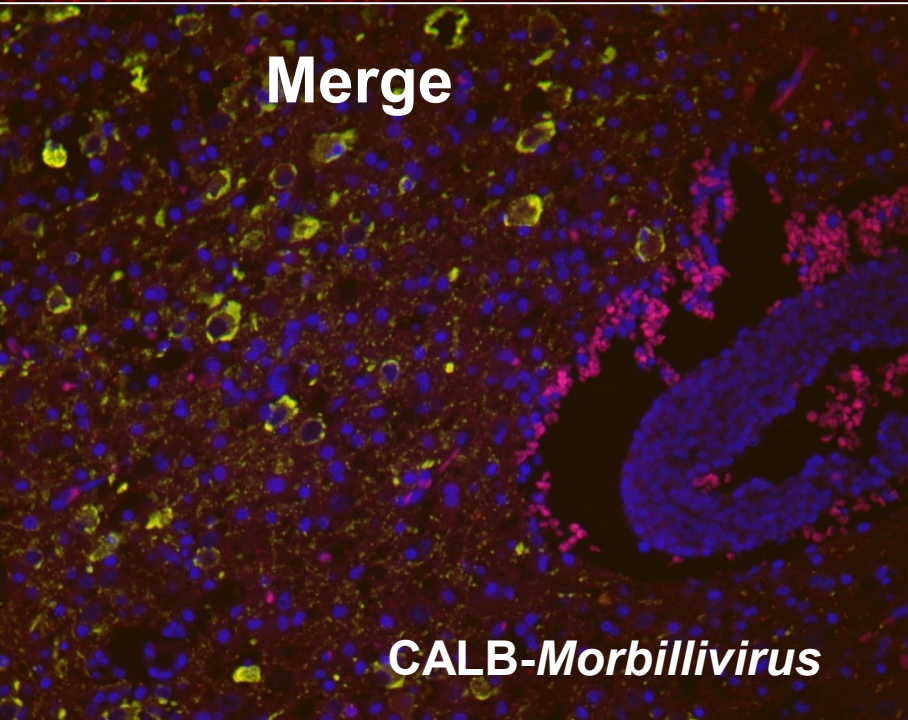
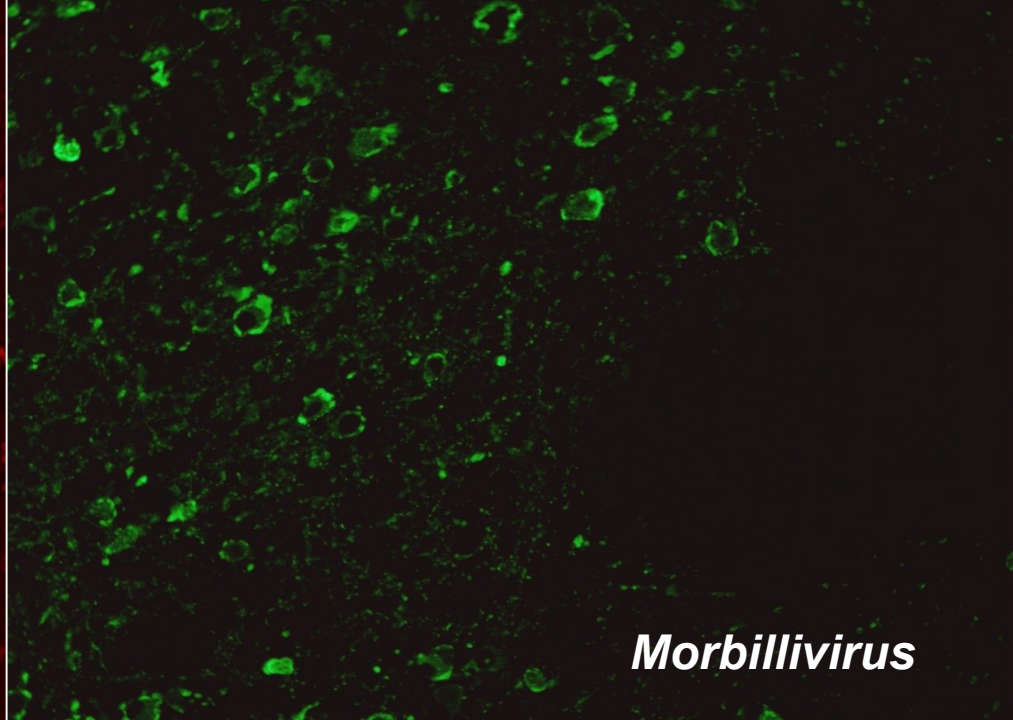
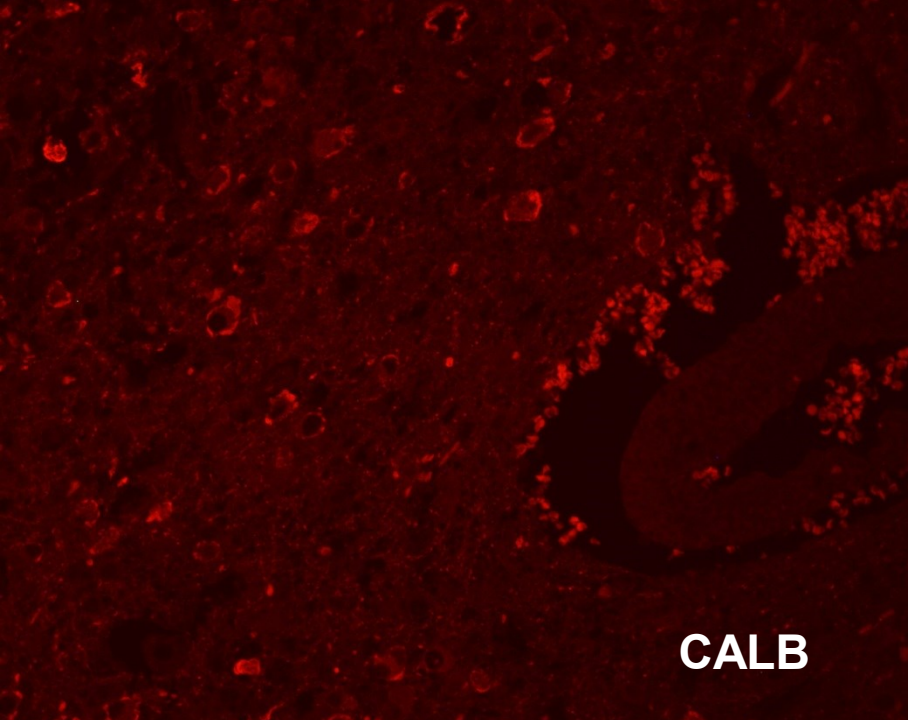
Infezione da DMV in *S. coeruleoalba*

“Brain-only” forms of DMV infection
(Domingo *et al.*, 1995; Soto *et al.*, 2011)
Un nuovo “modello di studio” nei confronti di SSPE (uomo) e di ODE (cane)???



Analoga positività
in *T. truncatus*
(Di Guardo *et al.*, 2013)

(Di Guardo *et al.*, 2011; Di Guardo & Mazzariol, 2016)



Non Communicable Human and Animal Diseases

- **Malattie genetiche**
- **Neoplasie**
- **Malattie autoimmuni**
- **Endocrinopatie**
- **Malattie neurodegenerative** (*Alzheimer's disease, prion diseases*)

Alzheimer's-like Pathology in Dolphins

(Gunn-Moore *et al.*, 2018; Davis *et al.*, 2019; Di Guardo, 2018)

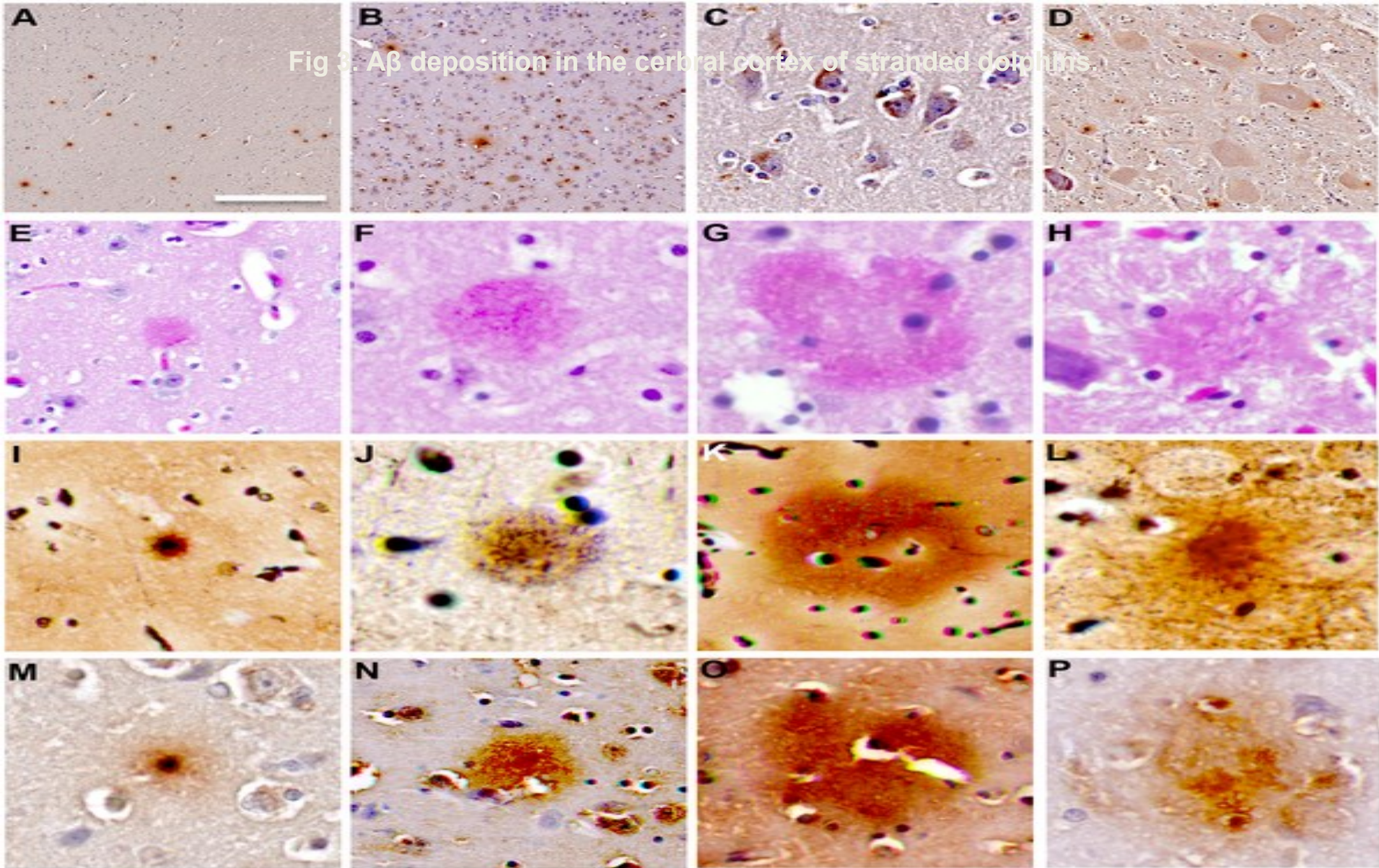
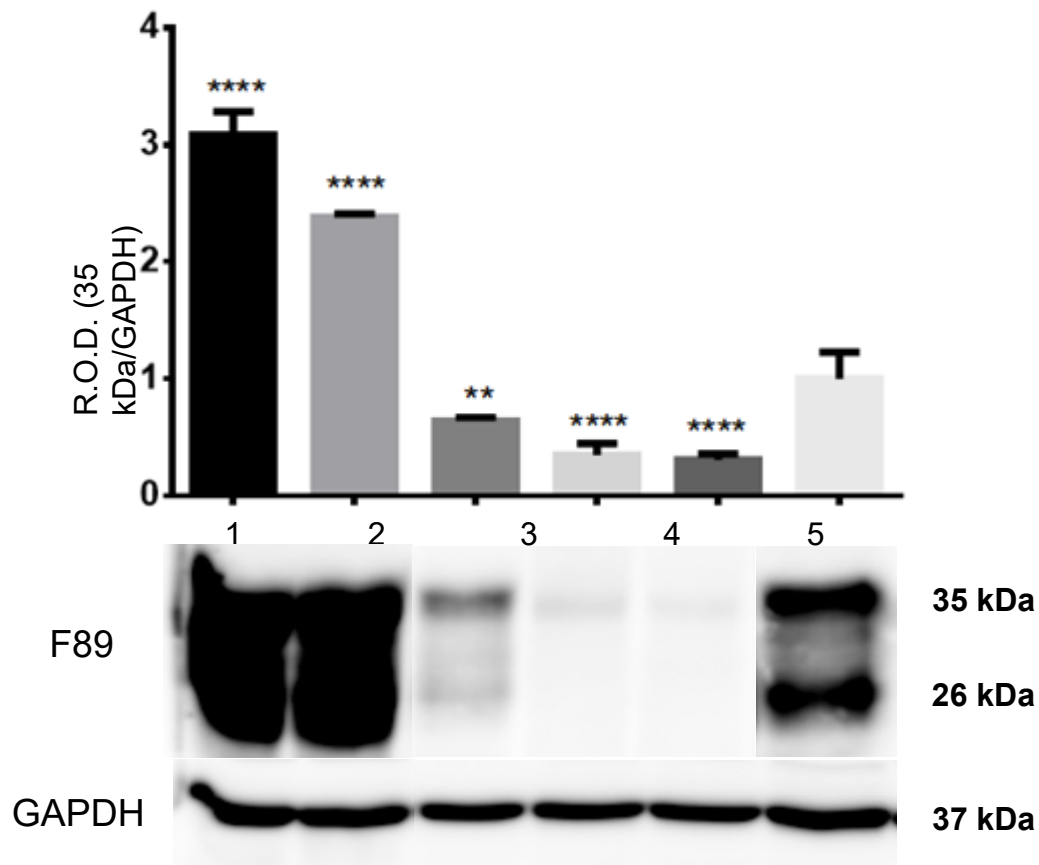


Fig 3. A β deposition in the cerebral cortex of stranded dolphins.

Davis DA, Mondo K, Stern E, Annor AK, Murch SJ, et al. (2019) Cyanobacterial neurotoxin BMAA and brain pathology in stranded dolphins. PLOS ONE 14(3): e0213346. <https://doi.org/10.1371/journal.pone.0213346>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213346>



Analisi in WB per la proteina prionica cellulare (PrPc) nel tessuto cerebrale di *S. coeruleoalba*

Il WB mostra le tipiche bande di circa 35 e 26 kDa della proteina prionica cellulare (PrPc), ottenute grazie all'impiego del MabF89/160.1.5. La figura mostra il *pattern* di immunoreattività e l'intensità dell'espressione della PrPc a livello del tessuto cerebrale di 3 esemplari di stenella striata con neurobrucellosi da *Brucella ceti*, rinvenuti spiaggiati lungo la costa pugliese (**corsie 1 e 3**) ed alle Isole Canarie (**corsia 2**). Vengono altresì mostrati i risultati ottenuti su tessuto cerebrale di agnello (**corsia 4**) e capra (**corsia 5**), nonché su un esemplare di stenella striata, quest'ultimo come controllo negativo per *B. ceti*, rinvenuto spiaggiato lungo la costa tirrenica della Toscana (**corsia 6**).

Concluding Remarks

- Strategic role of stranded cetaceans for monitoring the health and the conservation *status*, as well as for the epidemiologic surveillance of free-ranging conspecifics and heterospecifics living in the open sea.
- Utility of cetaceans (as well as of wild and terrestrial vertebrates) as potential animal models for human communicable and non communicable diseases.
- As the SARS-CoV-2 pandemic reminds us, human, animal and environmental health are mutually and inextricably linked to each other, a concept clearly exemplified by the *One Health* principle.

A photograph of a dolphin leaping from the surface of the ocean. The dolphin is captured in mid-air, its body arched as it moves from left to right. The water is a deep blue, and the dolphin's reflection is visible on the surface below. A blue thought bubble with a black outline is positioned to the right of the dolphin, containing yellow text. The thought bubble has three smaller circles leading to it from the bottom left.

**THANKS SO
MUCH FOR
YOUR KIND
ATTENTION!!!**