Human Cytomegalovirus epidemiology

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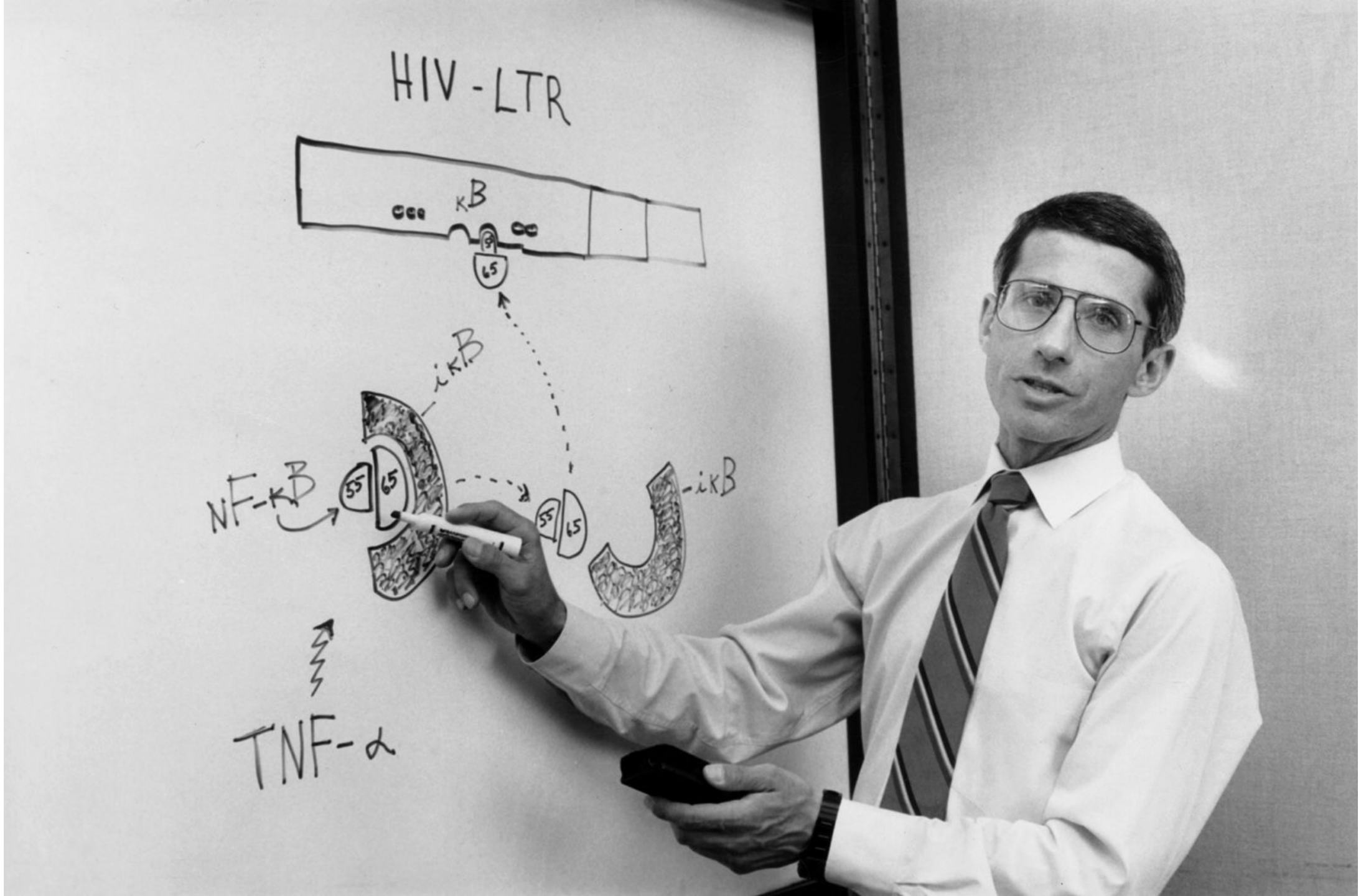
Dipartimento di Medicina molecolare Padova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Cerca

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chele Morari

In entrata - Google

ext Board Meeting

Massimo Bellini, antonio.frizziero@unipr.it, stefano.taddei@unipi.it, Lorenzo Galluzzi, massimiliano.mazzone@kuleuven.vib.be, pierre.sonveaux@uclouvain.be + 40

embers of the Board of the PhD program in Pharmacological Sciences

you for answering the Doodle.
nning date is **Wednesday, February 18th at 5 pm.**
connect to https://unipd.zoom.us/j/85233224923?pwd=9YPeOyH3tWB993jHsdgyJNUunFqdls.1&jst=2
ely hope that those who have not replied can connect too, so as to ease reaching the quorum.
enda is short but we will discuss very important subjects:
sion to further increase the scholarship by 100€;
osal of Honorary Doctorate in Pharmacological Sciences to Dr Anthony Fauci (Georgetown University, USA) (Proponent Prof D Abate).

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Meneghetti, 2
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THE GODFATHER OF VACCINES

Dr. Stanley Plotkin, Professor Emeritus at both Wistar Institute and the University of Pennsylvania and consultant to the vaccine industry, interviewed by Ira Pastor, ideaXme.

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Herpevirus e CMV

Virus	Nome Comune	Sieroprevalenza Globale (Adulti)	Note sulla Distribuzione
HHV-1	Herpes Simplex 1	**~64%** (<50 anni)	Quasi il 90% in alcune regioni (es. Italia, Africa).
HHV-2	Herpes Simplex 2	**~13%** (15-49 anni)	Più comune nelle donne (17%) rispetto agli uomini (10%).
HHV-3	Varicella-Zoster (VZV)	**>90%**	Quasi universale; in Francia stimata all'89,5%.
HHV-4	Epstein-Barr (EBV)	**>90%**	Infezione ubiquitaria acquisita precocemente in tutto il mondo.
HHV-5	Citomegalovirus (CMV)	**40% – 100%**	Molto variabile; ~50% in Europa/USA, fino al 100% in Africa.
HHV-6A/B	Roseolovirus	**>90%**	L'HHV-6B è acquisito entro i 2 anni dal 77% dei bambini.
HHV-7	Roseolovirus	**>90%**	Spesso acquisito leggermente dopo l'HHV-6; 98% negli adulti.
HHV-8	KSHV (Sarcoma Kaposi)	**2% – 10%** (Globale)	**Endemico**: 30-90% in Africa subsahariana; 10-25% in Italia.

Review

Epstein-Barr virus as a cause of multiple sclerosis: opportunities for prevention and therapy

Francesca Aloisi, Gavin Giovannoni, Marco Salvetti

Lancet Neurol 2023; 22: 338–49

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February 7, 2023
https://doi.org/10.1016/S1474-4422(22)00471-9

Department of Neuroscience, Istituto Superiore di Sanità, Rome, Italy (F Aloisi PhD); **Preventive Neurology Unit, Wolfson Institute of Preventive Medicine and Blizard Institute,**

Multiple sclerosis is a chronic inflammatory disease of the CNS that results from the interplay between heritable and environmental factors. Mounting evidence from different fields of research supports the pivotal role of the Epstein-Barr virus (EBV) in the development of multiple sclerosis. However, translating this knowledge into clinically actionable information requires a better understanding of the mechanisms linking EBV to pathophysiology. Ongoing research is trying to clarify whether EBV causes neuroinflammation via autoimmunity or antiviral immunity, and if the interaction of EBV with genetic susceptibility to multiple sclerosis can explain why a ubiquitous virus promotes immune dysfunction in susceptible individuals. If EBV also has a role in driving disease activity, the characterisation of this role will help diagnosis, prognosis, and treatment in people with multiple sclerosis. Ongoing clinical trials targeting EBV and new anti-EBV vaccines provide hope for future treatments and preventive interventions.

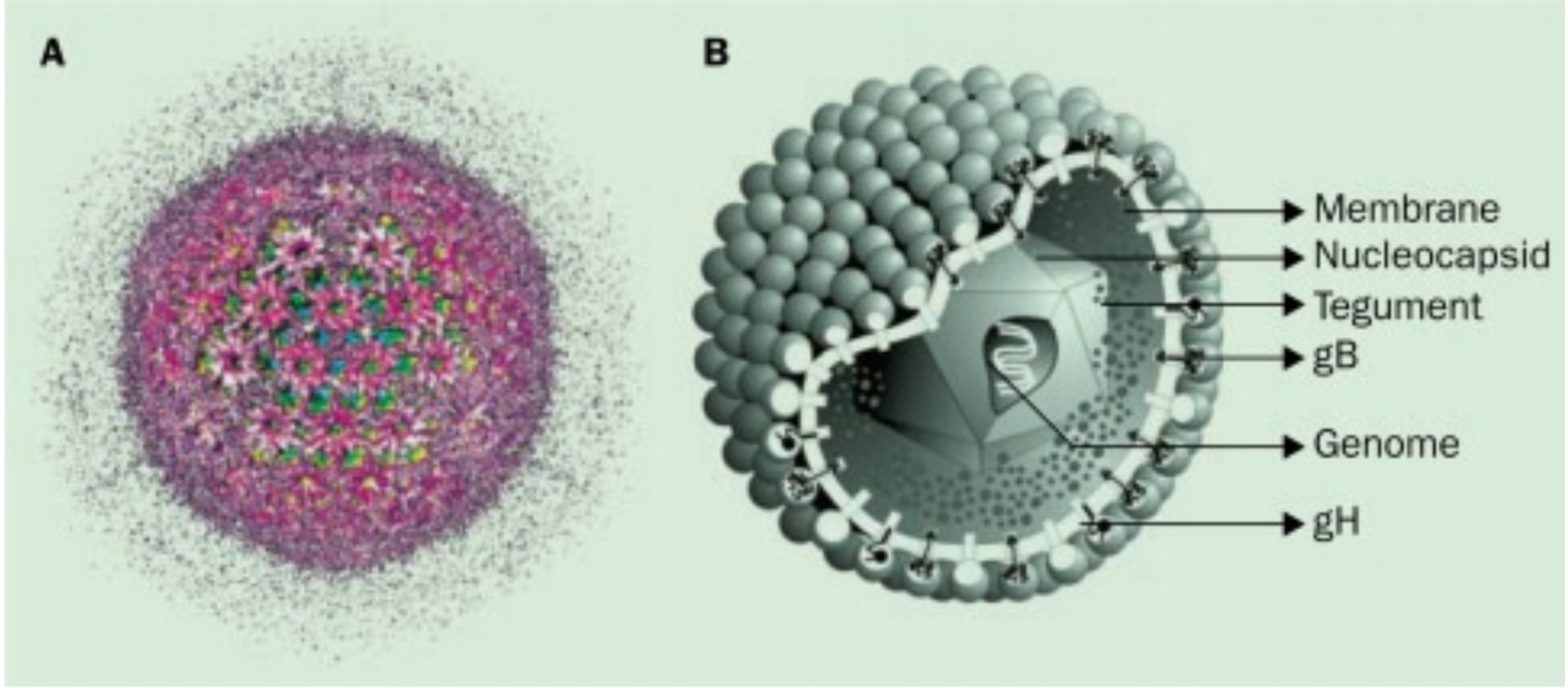
SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

AUTOIMMUNITY

Epstein-Barr virus reprograms autoreactive B cells as antigen-presenting cells in systemic lupus erythematosus

Shady Younis[1,2]*, Salvinaz I. Moutusy[1,2], Sajede Rasouli[1,2], Shaghayegh Jahanbani[1,2], Mahesh Pandit[1,2], Xiaohao Wu[1,2], Suman Acharya[1,2], Orr Sharpe[1,2], Tilini U. Wijeratne[1,2], Marlayna L. Harris[1], Emily Y. Yang[1], Yashaar Chaichian[1], Shima Parsafar[1], Matthew C. Baker[1], John B. Harley[3,4], Eric Meffre[1], Lawrence Steinman[5,6], Ann Marshak-Rothstein[7], Judith A. James[8,9], Olivia M. Martinez[10], Paul J. Utz[1,11], Dana E. Orange[12,13], Tobias V. Lanz[1,11], William H. Robinson[1,2,11]*

CMV



- Virus a DNA di 135Kpb (1/3 del DNA di *Micoplasma spp.*) con DNA altamente complesso, in grado di codificare >200 prodotti
- Virus a struttura lipidica esterna, inattivabile con soluzioni idroalcoliche e saponi
- Virus altamente specie-specifico. CMV infetta solo la specie umana.
- Virus che si trasmette per contatto cellula-cellula.

Come ci si infetta con CMV?


U WILL
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A

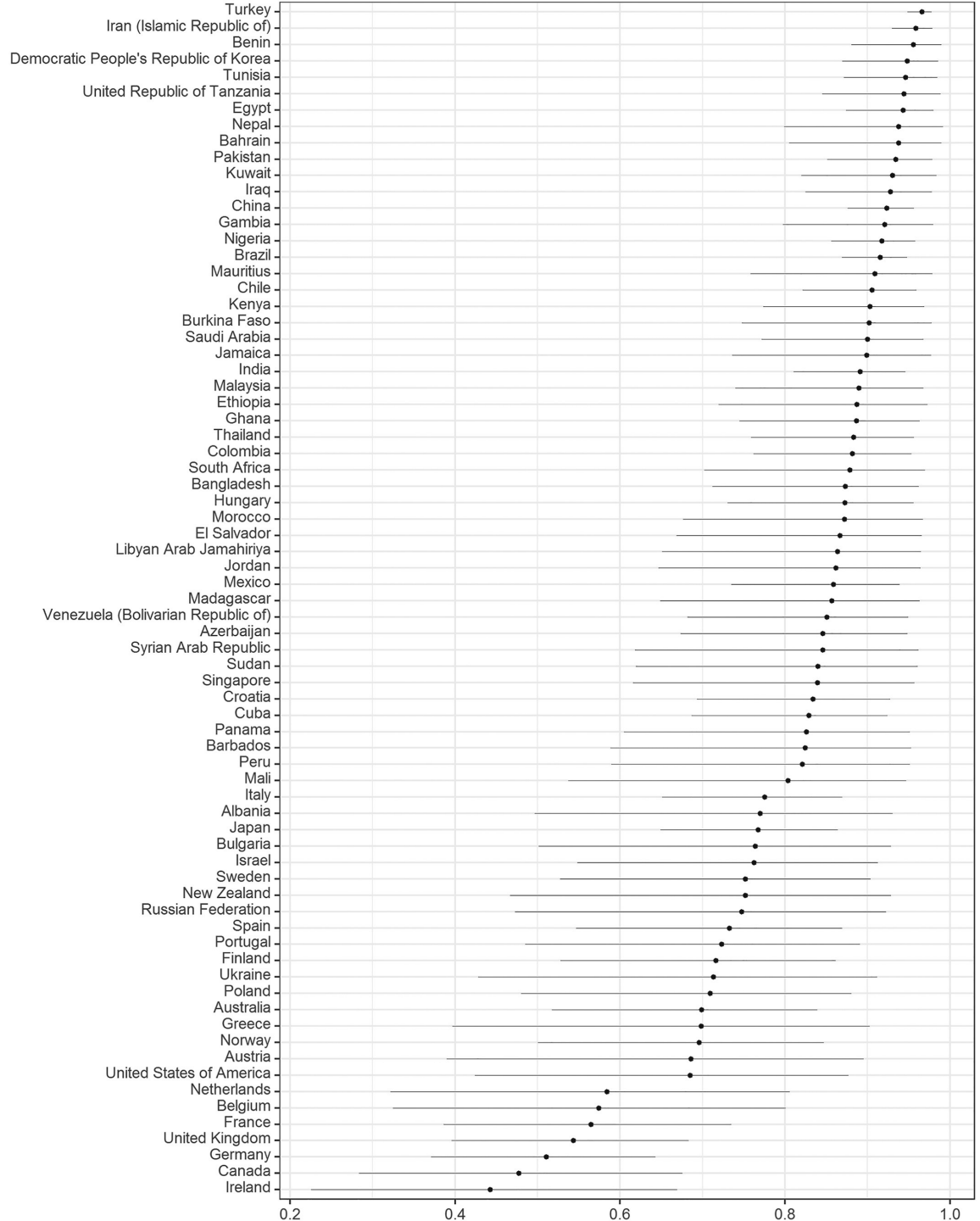
Sieroprevalenza

REVIEW

WILEY

Estimation of the worldwide seroprevalence of cytomegalovirus: A systematic review and meta-analysis

Mohamed Zuhair[1] | G. Suzanne A. Smit[2,3,4] | Gabriel Wallis[1] | Faiz Jabbar[1] | Colette Smith[5] | Brecht Devleesschauwer[6] | Paul Griffiths[1,5]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Fowler *et al. BMC Public Health* (2022) 22:1659
https://doi.org/10.1186/s12889-022-13971-7

BMC Public Health

RESEARCH Open Access

A systematic literature review of the global seroprevalence of cytomegalovirus: possible implications for treatment, screening, and vaccine development

Karen Fowler[1], Jacek Mucha[2], Monika Neumann[3], Witold Lewandowski[2†], Magdalena Kaczanowska[2], Maciej Grys[2], Elvira Schmidt[3], Andrew Natenshon[4], Carla Talarico[4†], Philip O. Buck[4] and John Diaz-Decaro[4*]

Table 2 Region-specific CMV seroprevalence (according to sex and age) and CMV shedding (according to age)

	Australia	Europe	Israel	Japan	Latin America	Canada and the United States	Total
Seroprevalence of CMV IgG by sex, % (95% CI[a])							
Men [32, 33]	NR	39.3 (34.9–43.8)	NR	NR	NR	48.0[b]	39.3–48.0
Women of reproductive age [32, 34–47]	NR	45.6–95.7	NR	60.2[b]	58.3–94.5	24.6–81.0	24.6–95.7
Aged 13–20 years[c] [37, 44]	NR	94.6[b]	NR	NR	86.5[b]	NR	86.5–94.6
Aged 20–30 years[c] [36, 37, 41, 44, 45]	NR	58.5–94.9	NR	NR	91.3[b]	54.4[b]	54.4–94.9
Aged 30–40 years[c] [36, 37, 40, 41, 45–47]	NR	62.3–95.7	NR	NR	NR	40.0–59.7%	40.0–95.7
Aged 40–50 years[c] [40, 45]	NR	87.7[b]	NR	NR	NR	69.8[b]	69.8–87.7
Seroprevalence of CMV IgM by sex, % (95% CI[a])							
Men[d]	NR	NR	NR	NR	NR	NR	NR
Women of reproductive age [34, 36, 41–45]	NR	1.0–4.6	NR	0.8[b]	0.0–0.7	2.3–4.5	0.0–4.6
Aged 20–30 years[c] [41, 45]	NR	1.0–2.0	NR	NR	NR	4.5[b]	1.0–2.0
Aged 30–40 years[c] [41, 45]	NR	2.8[b]	NR	NR	NR	2.3[b]	2.3–2.8
Aged 40–50 years[c] [45]	NR	NR	NR	NR	NR	2.4[b]	2.4

CMV shedding by age (regardless of diagnostic method), % (95% CI[a])							
Newborns/infants [48]	NR	0.0[b]	NR	NR	NR	NR	0.0[b]
Newborns/infants to adolescents	NR	NR	NR	NR	NR	NR	NR
Newborns/infants to children [48, 58, 59]	NR	11.0–51.9	NR	NR	NR	17.0[b]	11.0–51.9
Children [48]	NR	5.2[b]	NR	NR	NR	NR	5.2[b]
Adolescents [48]	NR	0.0[b]	NR	NR	NR	NR	0.0[b]
Adolescents to adults [60]	NR	70.2[b]	NR	NR	NR	NR	70.2[b]

Seroprevalence of CMV IgG by education level, % (95% CI[a])							
Household reference person's education level [61]							
Less than high school diploma	NR	NR	NR	NR	NR	31.3–37.2	31.3–37.2
High school diploma, GED, associate degree, some college	NR	NR	NR	NR	NR	16.7–22.6	16.7–22.6
College degree or higher	NR	NR	NR	NR	NR	17.8–34.7	17.8–34.7
Education level							
Up to university [47]	NR	NR	NR	NR	NR	60.0[b]	60.0[b]
University [47]	NR	NR	NR	NR	NR	51.0[b]	51.0[b]
Higher [41]	NR	58.0[b]	NR	NR	NR	NR	58.0[b]
Secondary [41]	NR	64.5[b]	NR	NR	NR	NR	64.5[b]
Primary and vocational [41]	NR	72.9[b]	NR	NR	NR	NR	72.9[b]

- Primaria. Infezione accompagnata da viremia, viruria e sieroconversione.
- Non primaria (spesso riferite come secondarie). Riattivazioni virali o reinfezioni con genotipi diversi (gB, gN, gH, gO)

Come mai non abbiamo ancora un vaccino per CMV?

- **1970 Stanley Plotkin. CMV attenuato Towne strain e dopo AD169**
- **mRNA-1647 (Moderna):** È stato il candidato più avanzato. Lo schema dello studio di Fase 3 prevedeva **3 dosi** somministrate per iniezione intramuscolare. Tuttavia, dati recenti di ottobre 2025 indicano che lo studio non ha raggiunto l'obiettivo primario di prevenire l'infezione nelle donne, portando all'interruzione del programma per il CMV congenito, sebbene i test continuino per i pazienti trapiantati. Efficacia 6-23% mediana 9%

- **gB/MF59 (Sanofi/GSK):** Un vaccino a subunità proteica che ha mostrato un'efficacia di circa il 50% in studi di Fase 2. Lo schema prevedeva **3 dosi** somministrate ai mesi **0, 1 e 6**. Efficacia 43-50%

- **V160 (Merck):** Un vaccino a virus intero carente di replicazione. Gli studi hanno valutato schemi a **2 o 3 dosi** in donne in età fertile. Efficacia 42%

infezione

Glycan shield

Recettori CMV

gB (4 genotipi gB1, gB2, gB3, gB4). La sierologia attualmente non distingue i genotipo

gL, gH, gO usato per infettare i fibroblasti

gH, gL e UL128-131 usato per infettare cellule epiteliali ed endoteliali