

Potential advances for screening techniques

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- Report on '[Improving Cancer Screening in the European Union](#)'
- Main recommendations:
- Improving existing screening
 - Cervical cancer, Colorectal cancer, Breast cancer
- New screening programmes
 - Lung cancer, prostate cancer



Vaccination and cancer

- Human Papilloma Virus (HPV) (HPV6)
 - Sexually transmitted
 - Causes cervical cancer in women
 - Anal, some mouth and throat cancers
- > 100 types of HPV
- Vaccines against 9 serotypes
- Male and female age 12+
- Incidence of cervical cancer 95% reduced

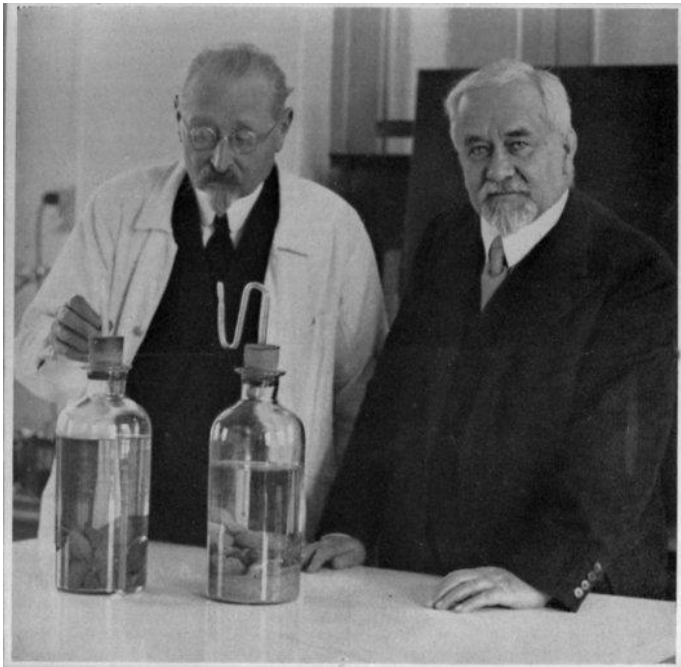
Sources:

- <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>

- The effects of the national HPV vaccination programme in England, UK, on cervical cancer and grade 3 cervical intraepithelial neoplasia incidence: a register-based observational study. Milena Falcaro, et al. The Lancet. December 04, 2021 | DOI: [https://doi.org/10.1016/S0140-6736\(21\)02178-4](https://doi.org/10.1016/S0140-6736(21)02178-4)

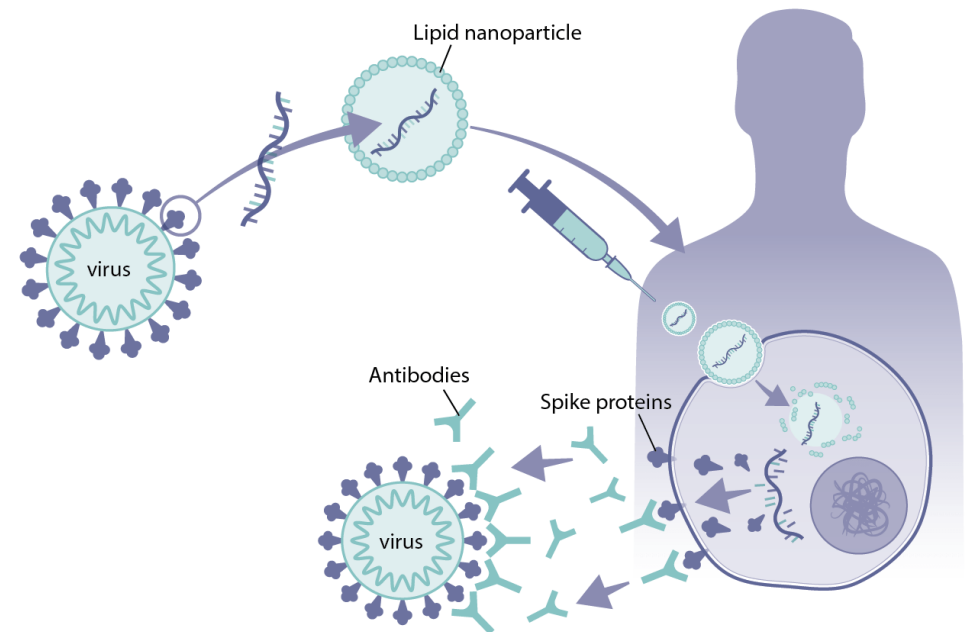
Impact of molecular biology on medicine

Bacillus Calmette-Guerin (BCG) is a live attenuated form of *Mycobacterium bovis* that was developed 100 years ago as a vaccine against tuberculosis. The figure shows Albert Calmette and Camille Guérin, co-inventors of the BCG vaccine



Source:
<http://www.patrimoinehospitalierdunord.fr/biographies-calmette-albert-1863-1933.html>

Today, RNA technology can produce specific designer vaccines within 3 months



Source:
<https://healthfeedback.org/how-were-mrna-vaccines-developed-for-covid-19/>

Potential new advances in Cancer Screening

- Genetic predisposition (BRcA)
- PCR for DNA fragmentation in plasma- major UK trial in progress
- Stool Microbiome- Pancreatic Cancer

PCR for DNA fragmentation in plasma

- DNA cancer fragments in plasma detected by PCR in advanced
- Major longitudinal UK study prospectively analysing plasma for Cancer DNA (Gallieri Study)

Gallieri Study: Detecting Cancer Early

- National Health Service, Cancer Research UK, King's College, UK
- Conventional scanning techniques
 - Expensive equipment (CT, MRI)
- PCR blood test relatively cheap and easy to install equipment in laboratories
- 140,000 volunteers (50-77 years old), different ethnicities
- Compare with conventional techniques
- Mobile Clinical Units- supermarket

Gallieri Study:NHS

- To determine practicality of test in NHS situation
- To determine efficiency and practicality of blood PCR to detect cancer early in the course of the disease.
- GRAIL Bio UK- principal funder and co-Ordinator
- National Health Service Partner
- Cancer Research UK and Kings College London
- Analysis on data and potential for clinical use

Stool Microbiome and Cancer

- Stool microbiome analysis now commercially available
- Faecal microbiomic signature- high specificity for pancreatic cancer
- Faecal metagenomic analysis signatures identified pancreatic ductal adenocarcinoma (better than salivary analysis)
- May provide noninvasive, cost-effective approach to early detection of pancreatic cancer.
- Case controlled Spanish study, Madrid, Barcelona, Erlangen, Heidelberg

Conclusions

- New cost-effective noninvasive tests to detect cancer earlier and monitor treatment
- Tests involve molecular analysis of body fluids (plasma, stool)
- PCR equipment relatively cheap and methods and core training can be standardized
- Ethical considerations important