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
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.

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


Source: [https://healthfeedback.org/how-were-mrna-vaccines-developed-for-covid-19/](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
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 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