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Journal of Next Generation: Sequencing & Applications

Review in 3 weeks

Publishing in 72 hours

Open Access



[Joakim Dillner](#)

Professor

Department of Laboratory Medicine

[Karolinska Institutet](#)

Sweden



Biography

- Joakim Dillner is professor in infectious disease epidemiology at Karolinska Institutet. His research is focused on cancer screening and tumor virology, especially human papillomavirus (HPV).
- He supervises several very large trials of HPV screening and Nordic follow-up studies of HPV vaccination and has experience in running international networking efforts for large-scale molecular epidemiological studies for evaluation of the role of infections in cancer.
- He is well-known as PI of Swedescreen, the first started randomised trial of HPV-screening (since 1997) and as PI of the WHO HPV LabNet Global Reference Laboratory (since 2006). Since 2012 he has also taken over the International Papillomavirus Reference Center. Professor Dillner has published more than 300 original research papers.



Research Interest

- Professor Joakim Dillner began research in tumor virology in 1982, working with George Klein on Epstein-Barr virus. Since 1989 he has been conducting Human Papillomavirus (HPV) research in the areas of molecular biology, immunology and vaccinology, clinical virology and epidemiology.

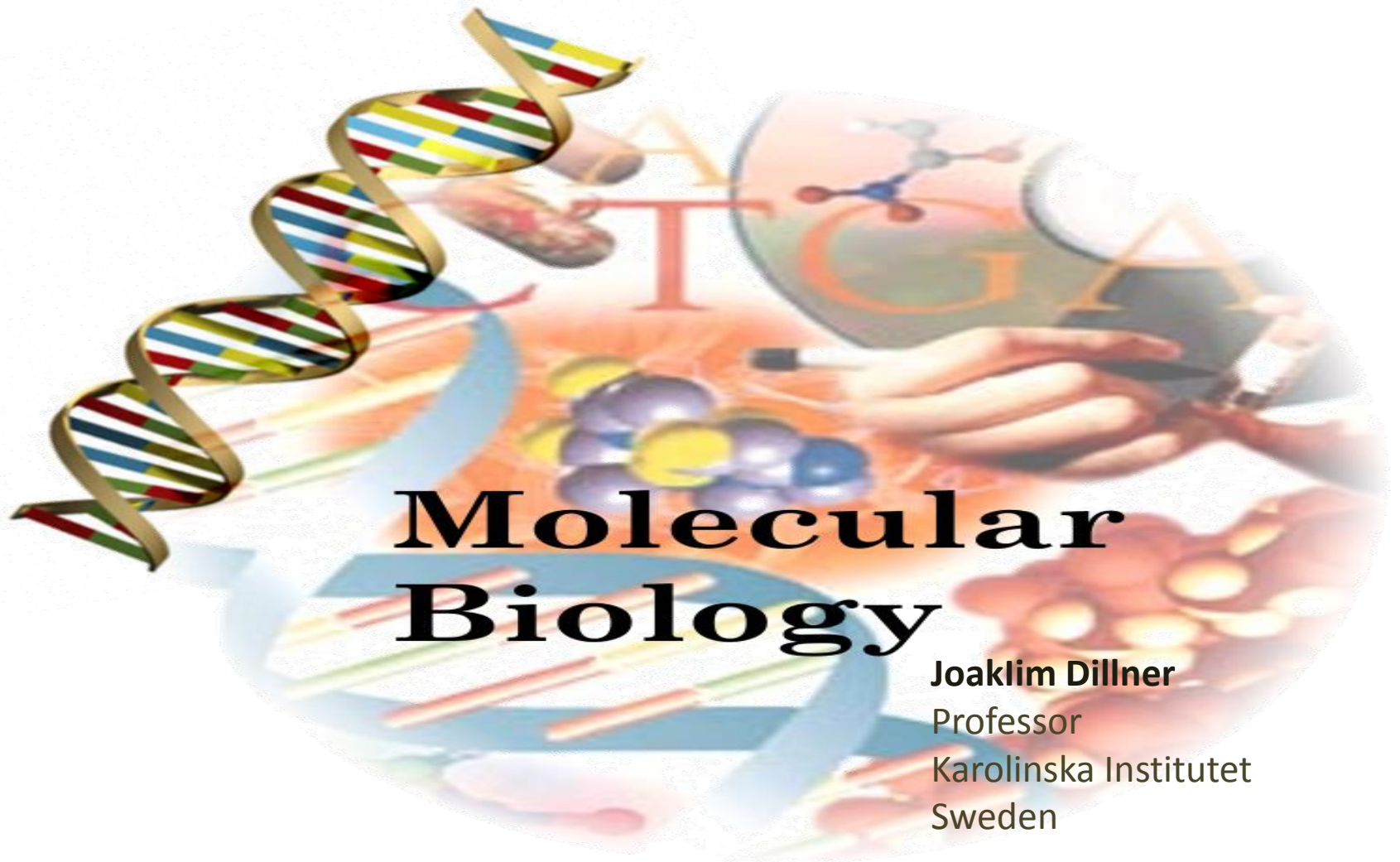


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Molecular Biology

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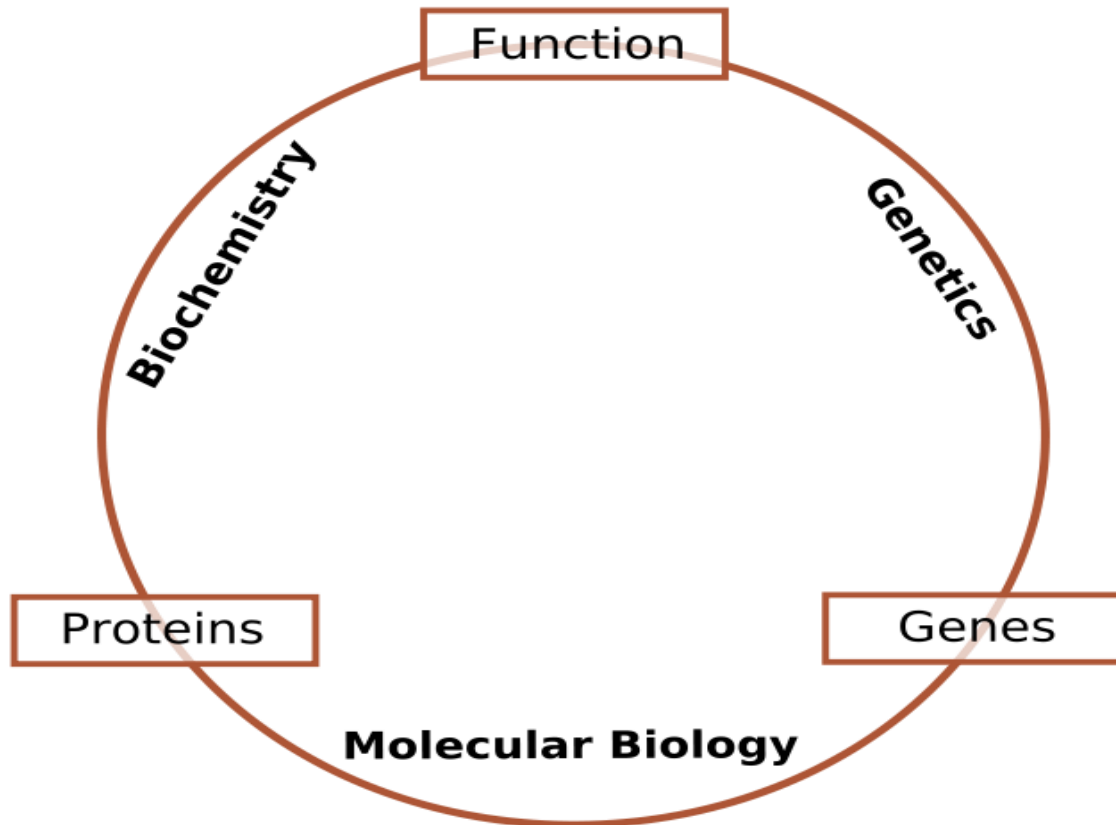


Introduction

- **Molecular biology** is the branch of biology that deals with the molecular basis of biological activity. This field overlaps with other areas of **biology** and **chemistry**, particularly **genetics** and **biochemistry**.
- Molecular biology chiefly concerns itself with understanding the interactions between the various systems of a cell, including the interactions between the different types of **DNA**, **RNA** and **protein biosynthesis** as well as learning how these interactions are regulated.

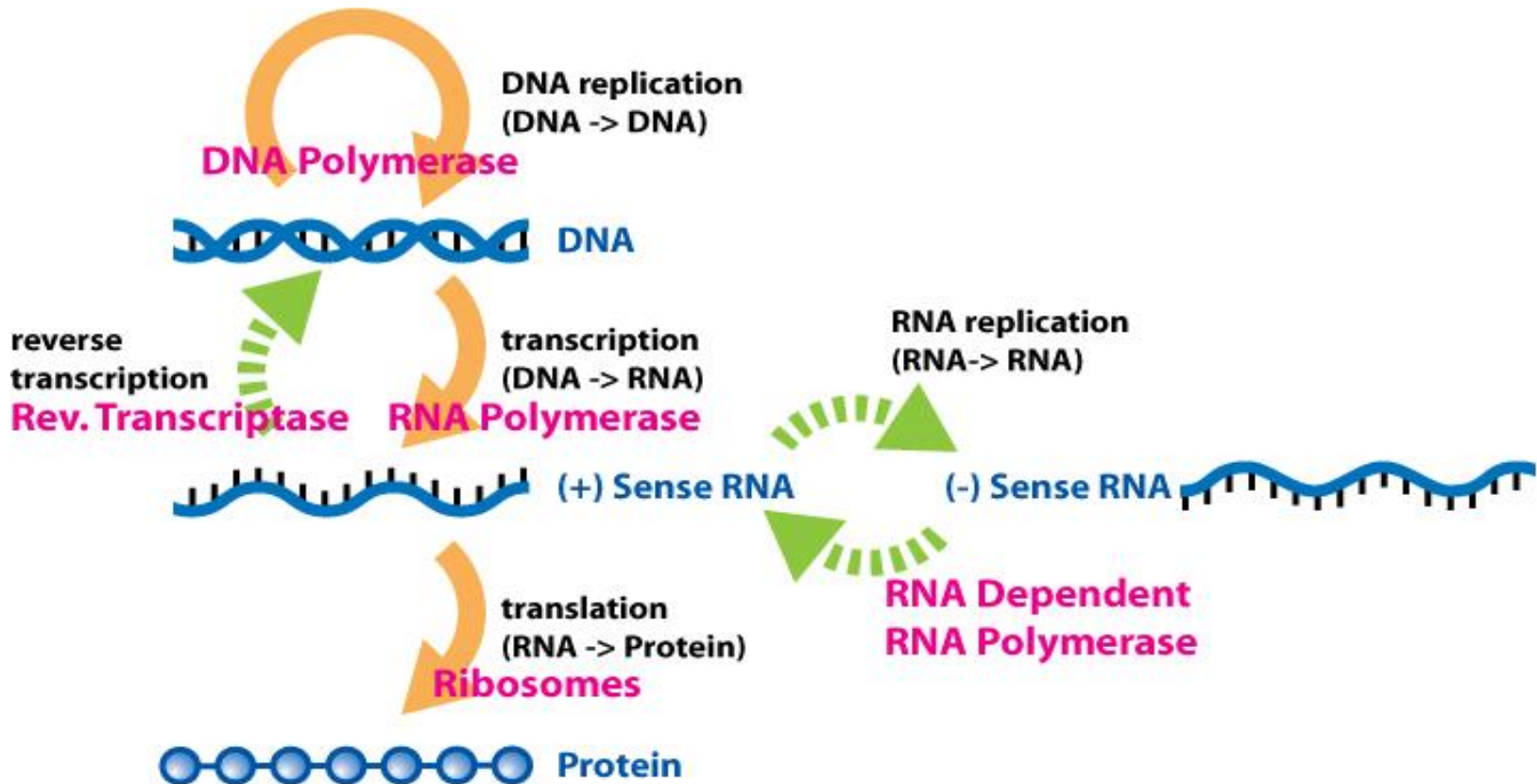


Relationship to other biological sciences





Interaction b/w DNA, RNA & Protein



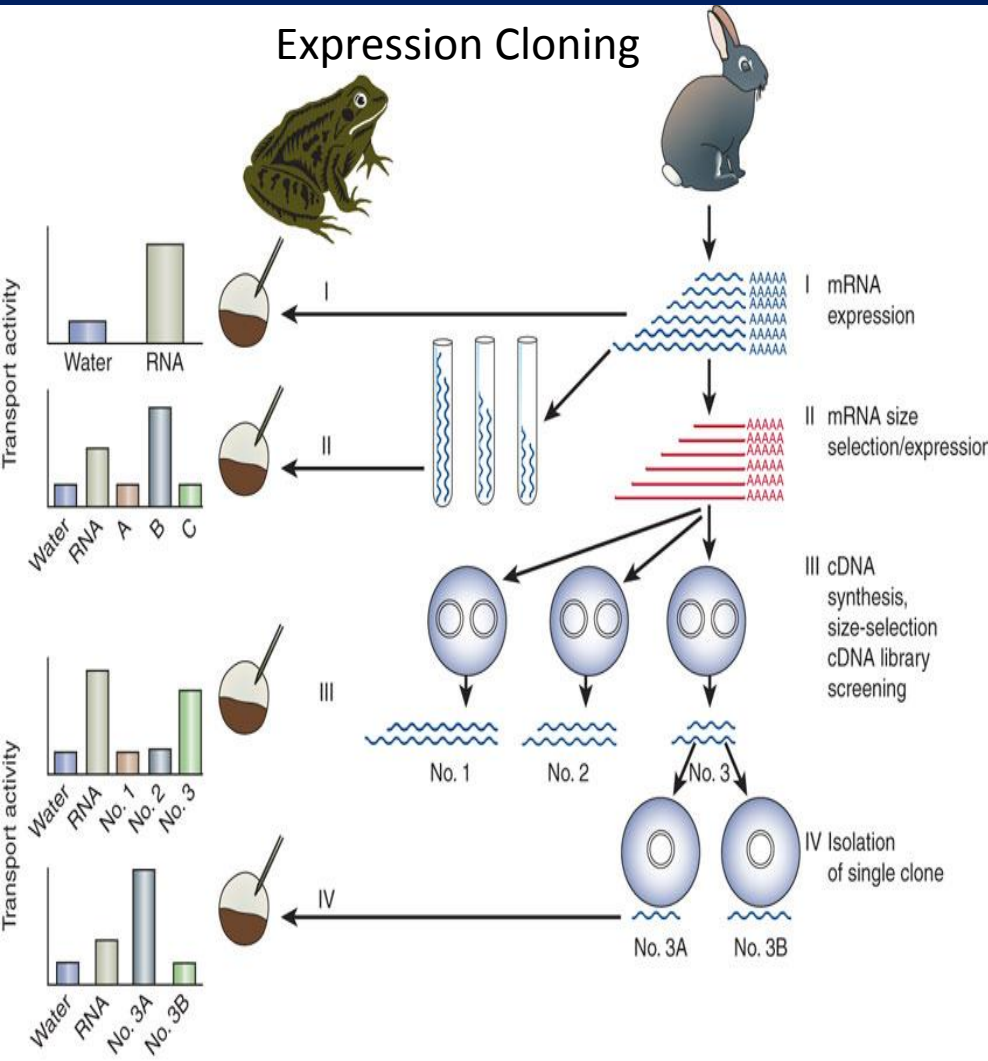


Techniques of molecular biology

- Expression cloning
- Polymerase chain reaction
- Gel electrophoresis
- Macromolecule blotting and probing
- Southern blotting
- Northern blotting
- Western blotting
- Eastern blotting
- DNA microarray
- Allele-specific oligonucleotide
- Antiquated technologies



Expression Cloning

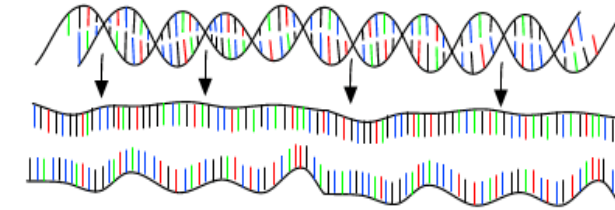


PCR : Polymerase Chain Reaction

30 - 40 cycles of 3 steps :

Step 1 : denaturation

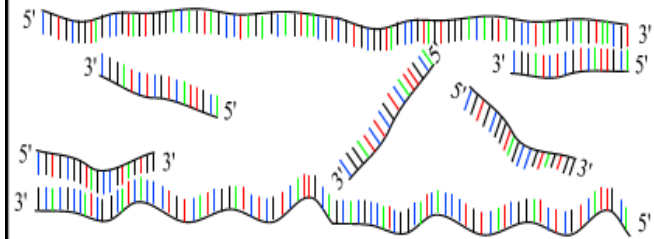
1 minut 94 °C



Step 2 : annealing

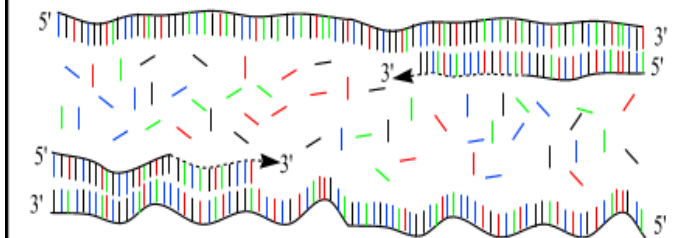
45 seconds 54 °C

forward and reverse primers !!!



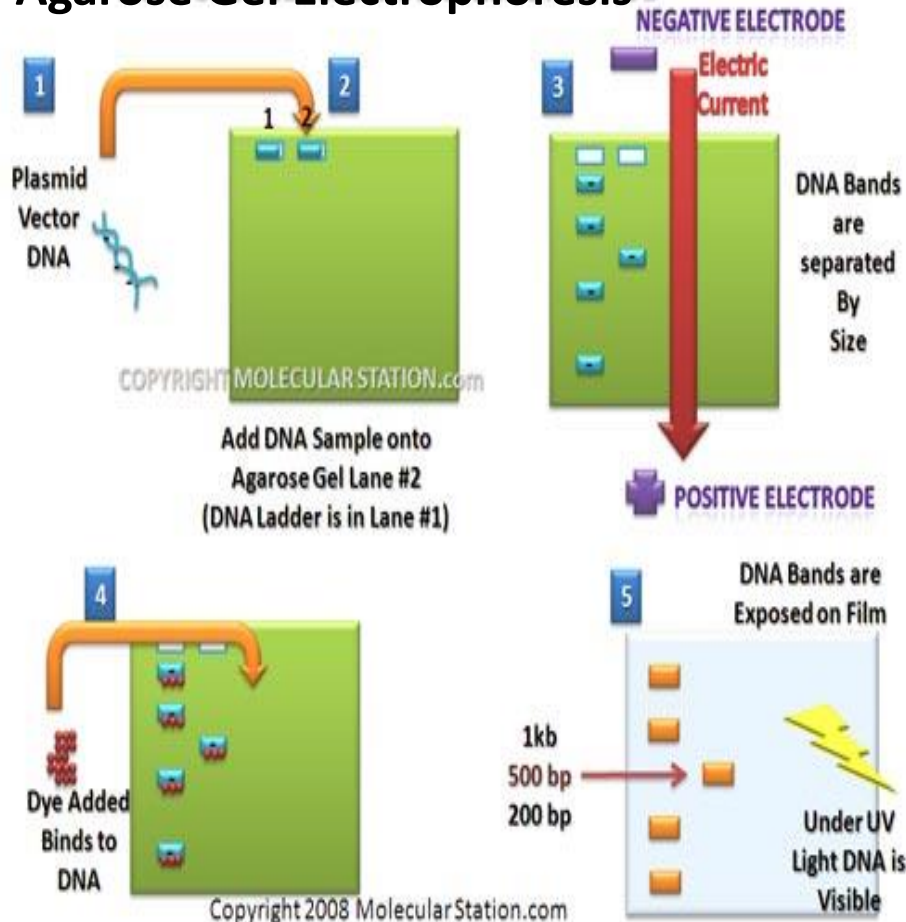
Step 3 : extension

2 minutes 72 °C
only dNTP's

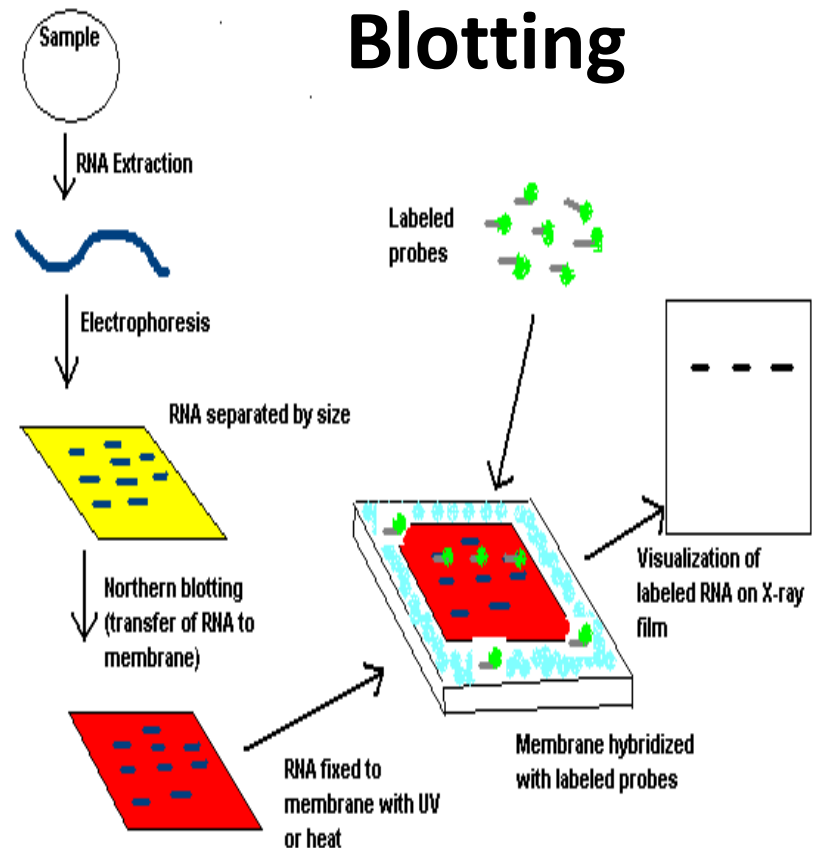


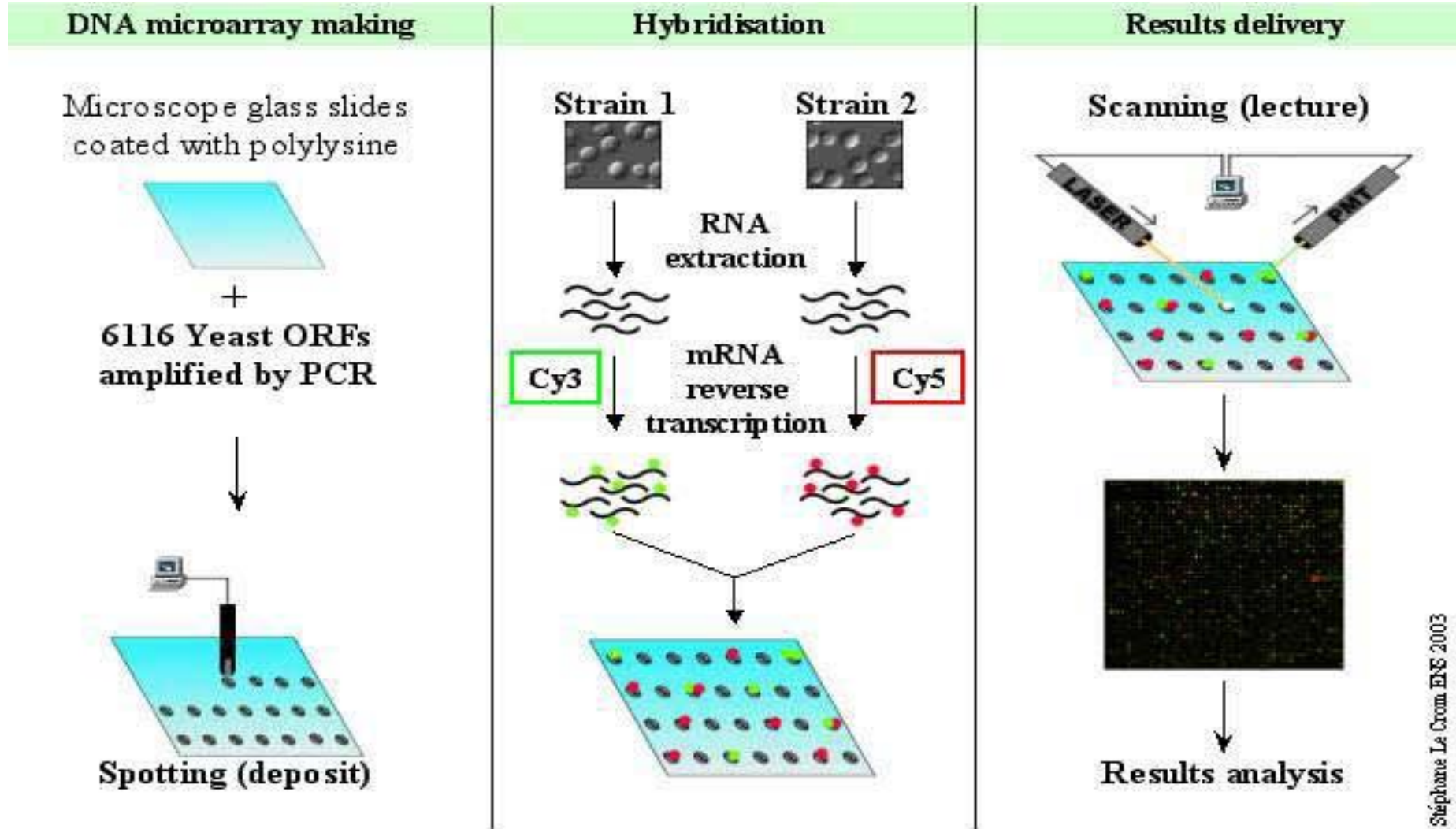


Agarose Gel Electrophoresis



Blotting





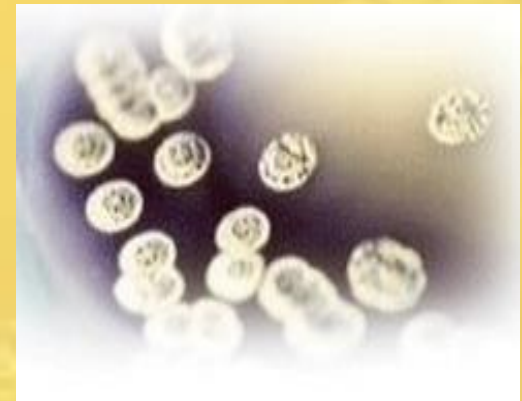


Clinical Significance

- Clinical research and medical therapies arising from molecular biology are partly covered under gene therapy.
- The use of molecular biology or molecular cell biology approaches in medicine is now called molecular medicine.
- Molecular biology also plays important role in understanding formations, actions, regulations of various parts of cells which can be used efficiently for targeting new drugs, diagnosis of disease, physiology of the Cell.

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