



UNIVERSITA' DEGLI STUDI DI MESSINA  
*Dipartimento di Scienze Biomediche, Odontoiatriche e delle Immagini  
Morfologiche e Funzionali*

Corso di Laurea in Biotecnologie Mediche (Classe LM-9)

**MOLECULAR DIAGNOSTICS IN VIROLOGY**

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**COURSE PROGRAM**

Viral pathogenesis: implantation of virus at the portal of entry, local replication, spread to target organs and spread to sites of shedding of virus into the environment.

Hints of viral species of biomedical interest:

- Respiratory viruses
- Viruses with dermatologic manifestations
- Gastrointestinal and fecal-oral hepatitis viruses
- Viruses that can cause multiple syndromes
- Opportunistic viruses associated with immunosuppression
- Blood-borne Hepatitis viruses
- Human Retroviruses
- Oncogenic viruses
- Zoonotic viruses
- Arboviruses

Diagnostic virology: Specimen Type for virus detection, sample collection devices and transport, comparison of assay used for diagnosis of viral infection, guidelines and standards for molecular virology testing.

Virology Techniques:

Culture and tissue-based Diagnostic Techniques

- Conventional viral culture and cell lines
- Cytopathic effect
- Viral growth rates
- Quantification by plaque-forming units and TCID50
- In situ Hybridization
- Phenotypic analysis of viral variant

## Molecular Techniques: application in virology

- Importance of nucleic acid structure and viral sample processing
- PCR variants used for virology: Droplet digital PCR, Nested PCR, Multiplex PCR
- PCR controls
- Viral load testing
- Nucleic acid tests (NAT)
- Virus identification and genotyping by Sanger sequencing and Next generation sequencing
- Direct-acting antiviral agents resistance testing
- Virtual Phenotype Resistance Assay