Universidad Carlos III de Madrid

SUBJECT: Application of "omics" technologies to the diagnosis of complex diseases and the development of new medicines		
MASTER DEGREE: MÁSTER UNIVERSITARIO EN GESTIÓN Y DESARROLLO DE TECNOLOGÍAS BIOMÉDICAS	ECTS: 5.0	QUARTER: 2

TIMETABLE FOR THE SUBJECT

WEEK	SESSION	DESCRIPTION OF EACH SESSION	GROUP (X mark)		Indicate if a different lecture room is needed (computer, audiovisual, etc.)	HOMEWORK PER WEEK		
			1	2		DESCRIPTION	ATTENDING HOURS	HOMEWORK Max. 7H/WEEK
1	1	*Introduction: The omic techniques in hereditary disorders. Application of NGS and arrays-CGH panels in the molecular diagnosis of hereditary hearing loss. * Use of the Illumina Mi-seq platform in clinical practice. Customized panel design. Clinical exome Trusight-One of Illumina. NIPT Clarigo Test.	X		INF 1.1.G03 DUAL		3	6
2	2	*Application of the NGS in the diagnosis of breast cancer and colon cancer. *Analysis of datasets with bioinformatic tools in hereditary cancer: Multiplicom BCRA and Lynch Syndrome.	X		INF 1.1.G03 DUAL		3	6
3	3	*Bioinformatic analysis of datasets for the molecular diagnosis of cystic fibrosis, neurosensory pathology and familial heart disease. *Metagenomics: characterization of microbiote of patients.	X		INF 1.1.G03 DUAL		3	6

4	4	*Use of NGS (exome sequencing) for detection of somatic mutations. * Use of next generation sequencing in genetic diagnostic : WES approach	**X**		INF 1.1.G03 DUAL		3	6
5	5	*Development of bioinformatic pipelaines for the analysis of genomic data (I). *Development of bioinformatic pipelaines for the analysis of genomic data (II).	**X**		INF 1.1.G03 DUAL		3	6
6	6	*RNA-seq: Applications * Application of RNAseq: expression profiles of mRNA and microRNAs	**X**		INF 1.1.G03 DUAL		3	6
7	7	* SNP arrays: Applications * Application of aCGH to genetic diagnosis	**X**		INF 1.1.G03 DUAL		3	6
8	8	*CRISP-Cas9: introduction * CRISP-Cas9: design and allelic mosaicism detection by NGS	**X**		INF 1.1.G03 DUAL		3	6
9	9	* Tutorial	**X**		INF 1.1.G03 DUAL		2	6
10	10	* Bioinformatics platforms: Spanex; Spanish exome service; TEAM; Babeblomics * Experimental design and applications of gel-based proteomic techniques: 2D-PAGE and DIGE	**X**		INF 1.1.G03 DUAL		3	6
11	11	*Applications of proteomic techniques based on mass spectrometry: Silac, Itraq, etc. *Databases and bioinformatic tools for the analysis of	**X**		INF 1.1.G03 DUAL		3	6

		results generated in proteomics.						
12	12	*Exploratory data analysis in bioinformatics *Application in Methylation arrays and pathology	**X**		INF 1.1.G03 DUAL		3	6
		Theoretical work on contents of the subject						28
TOTAL HOURS							35	100