





1. *PLANEAMENTO DAS AULAS*
2. *INTRODUÇÃO AOS TESTES DE ECOTOXICOLOGIA*
3. *EXEMPLOS*
4. *CASO PRÁTICO DE ESTUDO: BEZAFIBRATO*
5. *ORGANISMOS TESTE*
6. *DELINEAMENTO EXPERIMENTAL*
7. *TRABALHOS EM CURSO E PRESPECTIVAS DE MESTRADO*

random][pLasatd



## PLANEAMENTO DAS AULAS

AULA 1 (02.03) – INÍCIO DOS TESTES DE ECOTOXICOLOGIA

AULA 2 (09.03) – EFEITOS DO BEZAFIBRATO NA GERMINAÇÃO DOS ORGANISMOS TESTE (TAXAS DE INIBIÇÃO E CONSTANTES DE INIBIÇÃO IC50)

AULA 3 (16.03) – MARCADORES BIOFÍSICOS DE TOXICIDADE I

AULA 4 (23.03) – MARCADORES BIOFÍSICOS DE TOXICIDADE II

AULA 5 (06.04) – ANÁLISE ESTATÍSTICA MULTIVARIADA E ÍNDICES FOTOQUÍMICOS (TEÓRICO-PRÁTICA)

AULA 5 (13.04) - MARCADORES BIOQUÍMICOS DE TOXICIDADE I – PIGMENTOS VEGETAIS

AULA 6 (20.04) – MARCADORES BIOQUÍMICOS DE TOXICIDADE II – PIGMENTOS VEGETAIS II

AULA 7 (27.04) - MARCADORES BIOQUÍMICOS DE TOXICIDADE III – DANO MEMBRANAR

AULA 8 (04.05) – MARCADORES BIOQUÍMICOS DE TOXICIDADE IV

AULA 9 (11.05) - TÉCNICAS DE EXTRAÇÃO E ANÁLISE DE METAIS PESADOS

AULA 10 (18.05) - NANOTOXICOLOGIA



## INTRODUÇÃO AOS TESTES DE ECOTOXICOLOGIA

**BIO-INDICADORES:** ORGANISMOS QUE EXPRESSAM SINTOMAS PARTICULARES OU RESPOSTAS QUE INDIQUEM MUDANÇAS EM ALGUMA INFLUÊNCIA AMBIENTAL, GERALMENTE DE FORMA QUALITATIVA (HAWKSWORTH, 1992). DÃO INFORMAÇÃO QUALITATIVA (WOLTERBEEK *ET AL.*, 1995).

**BIO-MONITORES:** ORGANISMOS, CUJA DISTRIBUIÇÃO E POPULAÇÕES SÃO ESTUDADOS DURANTE UM CERTO ESPAÇO DE TEMPO, E COMPARADOS A UM MODELO, ONDE OS DESVIOS DO ESPERADO SÃO AVALIADOS. DÃO INFORMAÇÃO QUANTITATIVA (WOLTERBEEK *ET AL.*, 1995).

**BIO-MARCADORES:** SÃO ENTIDADES QUE PODEM SER MEDIDAS EXPERIMENTALMENTE E INDICAM A OCORRÊNCIA DE UMA DETERMINADA FUNÇÃO NORMAL OU PATOLÓGICA DE UM ORGANISMO OU UMA RESPOSTA A UM AGENTE STRESSOR.

random][pLasatd



## INTRODUÇÃO AOS TESTES DE ECOTOXICOLOGIA

### TESTES DE TOXICIDADE AGUDA

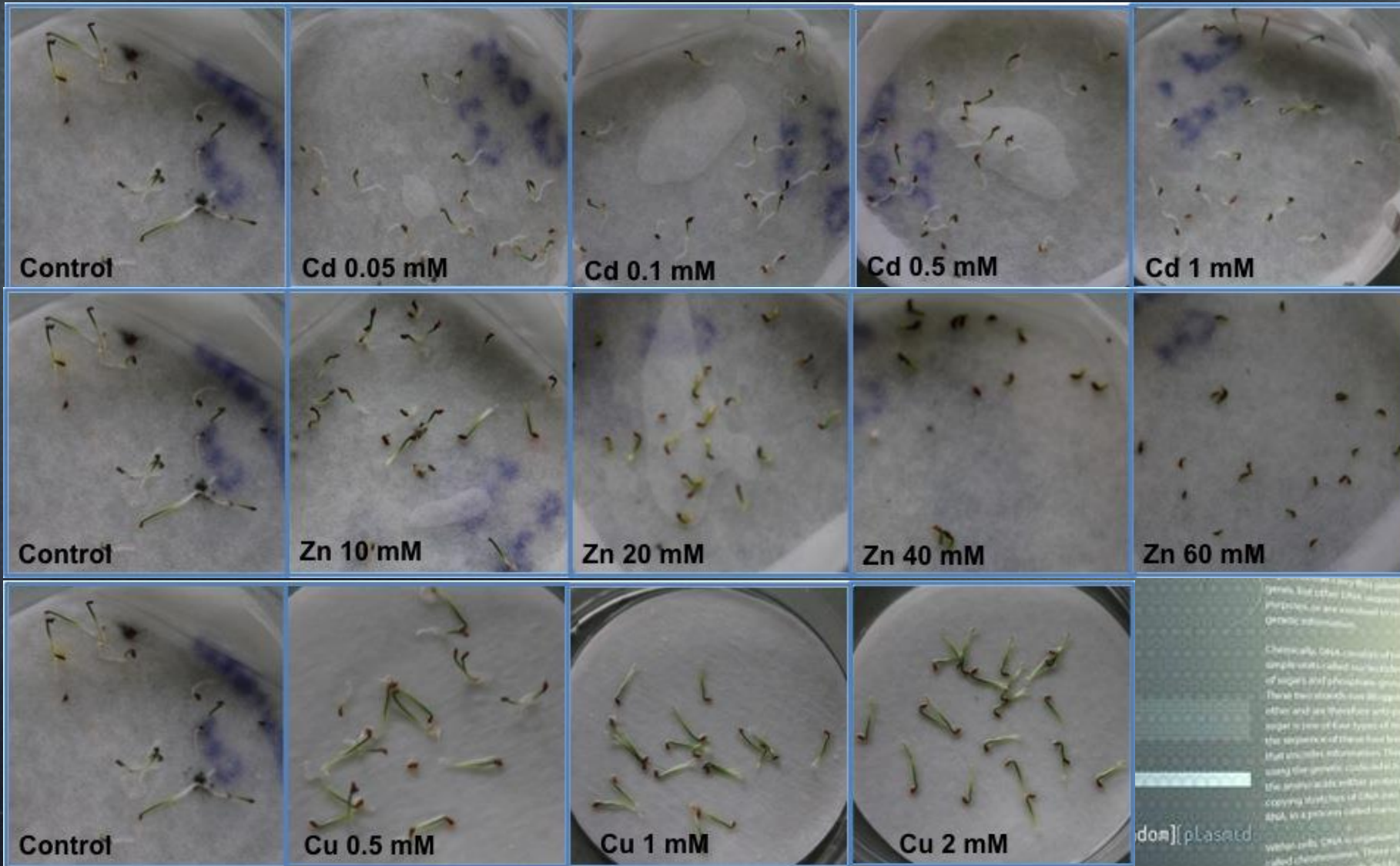
ACUTE TOXICITY DESCRIBES THE ADVERSE EFFECTS OF A SUBSTANCE THAT RESULT EITHER FROM A SINGLE EXPOSURE OR FROM MULTIPLE EXPOSURES IN A SHORT PERIOD OF TIME. TO BE DESCRIBED AS ACUTE TOXICITY, THE ADVERSE EFFECTS SHOULD OCCUR WITHIN 14 DAYS OF THE ADMINISTRATION OF THE SUBSTANCE.

### TESTES DE TOXICIDADE CRÓNICA

CHRONIC TOXICITY, THE DEVELOPMENT OF ADVERSE EFFECTS AS A RESULT OF LONG TERM EXPOSURE TO A CONTAMINANT OR OTHER STRESSOR, IS AN IMPORTANT ASPECT OF AQUATIC TOXICOLOGY. ADVERSE EFFECTS ASSOCIATED WITH CHRONIC TOXICITY CAN BE DIRECTLY LETHAL BUT ARE MORE COMMONLY SUBLETHAL, INCLUDING CHANGES IN GROWTH, REPRODUCTION, OR BEHAVIOR. CHRONIC TOXICITY IS IN CONTRAST TO ACUTE TOXICITY, WHICH OCCURS OVER A SHORTER PERIOD OF TIME TO HIGHER CONCENTRATIONS. VARIOUS TOXICITY TESTS CAN BE PERFORMED TO ASSESS THE CHRONIC TOXICITY OF DIFFERENT CONTAMINANTS, AND USUALLY LAST AT LEAST 10% OF AN ORGANISM'S LIFESPAN.

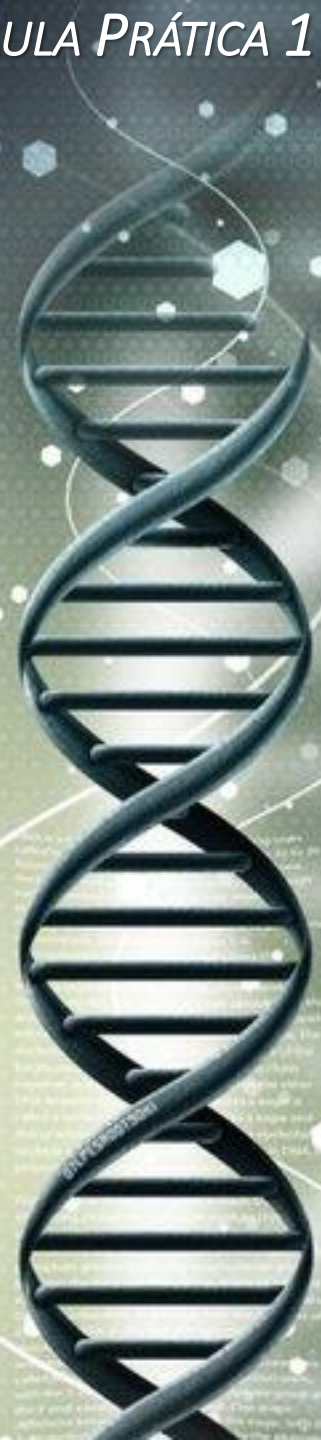


EXEMPLOS

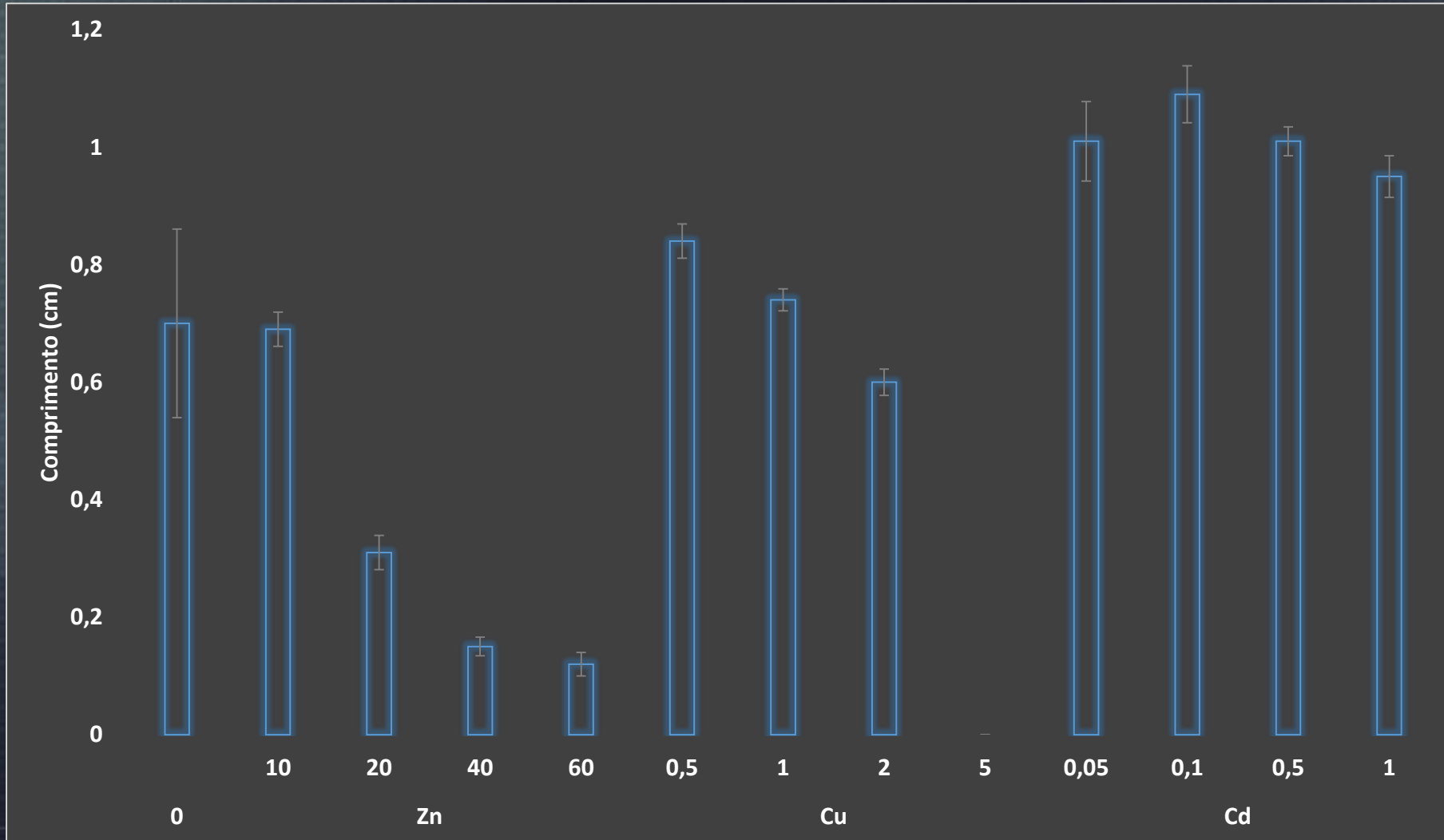


Chemically, DNA consists of two complementary strands of sugar-phosphate backbones, with nitrogenous bases of sugars and phosphate groups attached to each other and as therefore interlocked to each other. These two strands are 20 angstroms apart, and a single is one of four types of nitrogenous bases, in the sequence of these has been used to describe that genetic information. This information is used using the genetic code to synthesize the sequence of the proteins in other proteins. The code is used for copying messages of DNA into the mRNA and then into a protein called translation.

When cells DNA is organized into long strands called chromosomes. These chromosomes are duplicated before cells divide. In a process called replication, eukaryotic organisms produce two copies of DNA, and prokaryotes produce one copy. The DNA in the nucleus and some of those that are in the mitochondria or chloroplasts are called organelle DNA.

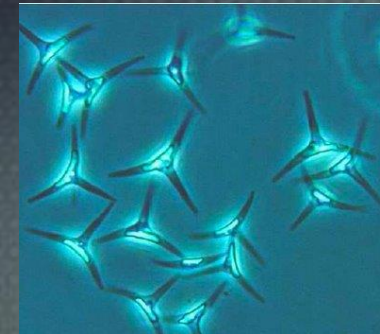
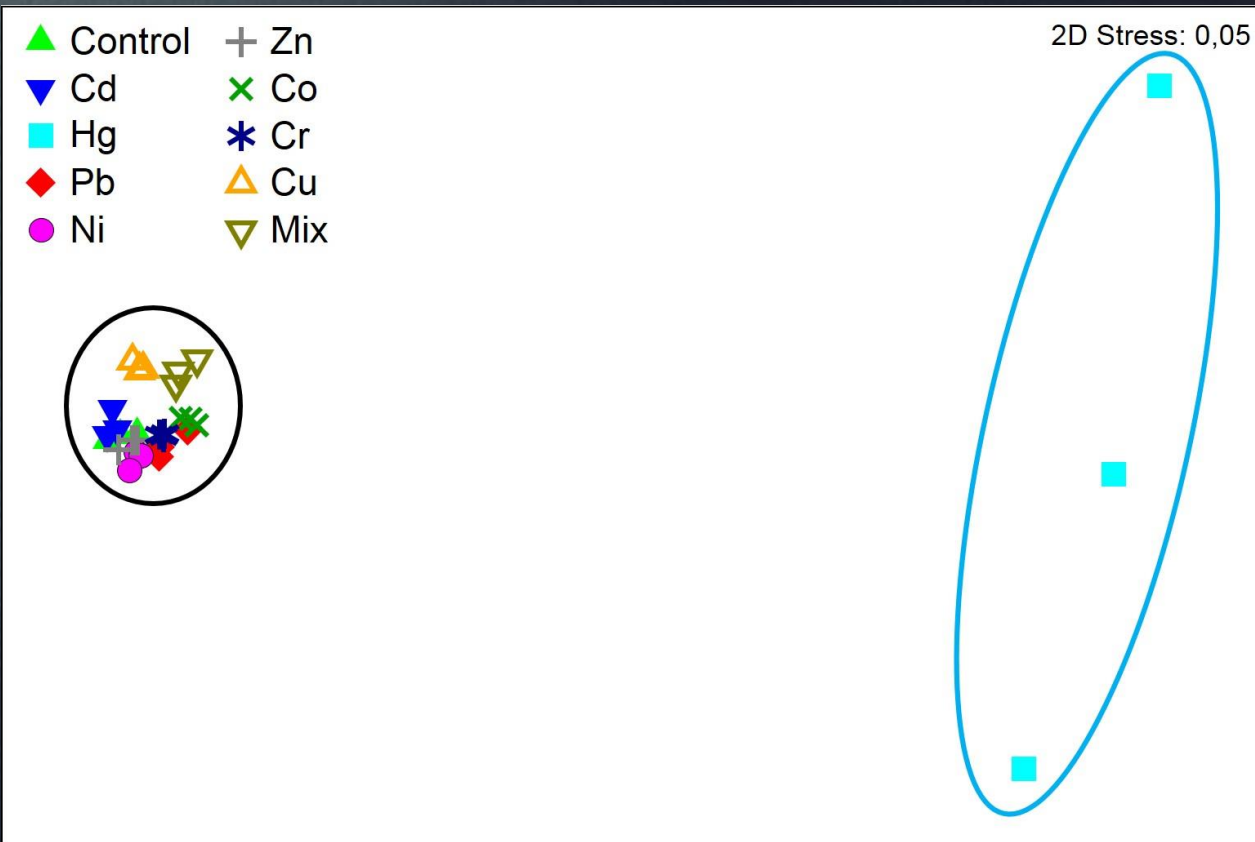


EXEMPLOS





EXEMPLOS



*Phaeodactylum tricornutum*

random][pLasatd

Chemically, DNA consists of two complementary strands of equal length and phosphate groups. The two strands are held together and are therefore said to be antiparallel to each other. The sequence of these base pairs is the genetic code that encodes information. This information is used to synthesize proteins and other molecules. The process of copying matches of DNA over the entire genome is called DNA replication. In eukaryotic organisms, DNA is packaged into chromosomes and is found in the nucleus and some organelles such as mitochondria and chloroplasts. In prokaryotes, DNA is found in the cytoplasm and is not packaged into chromosomes.



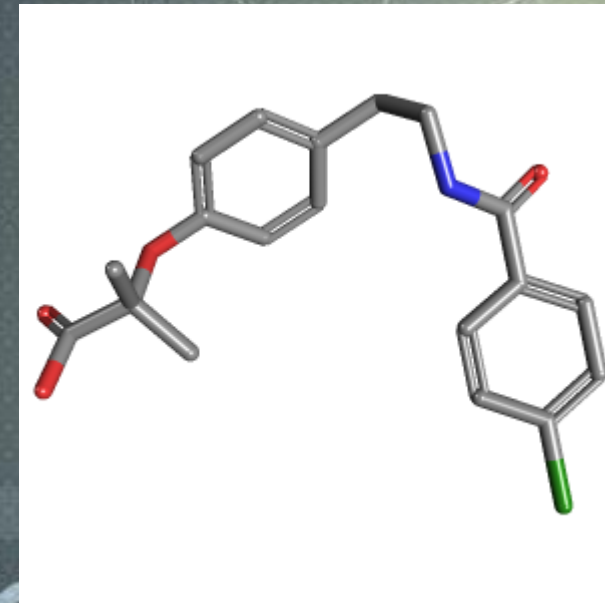
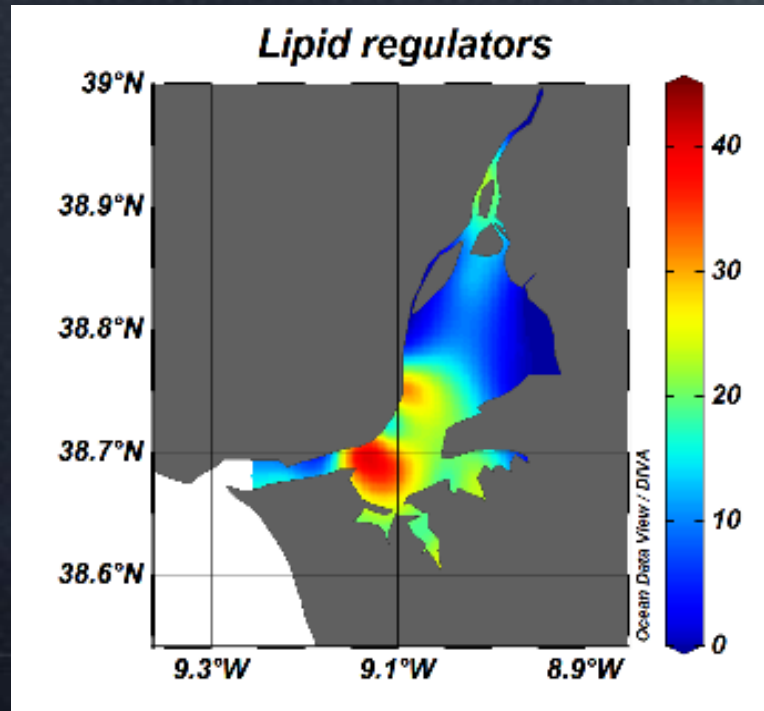






CASO PRÁTICO DE ESTUDO: BEZAFIBRATO

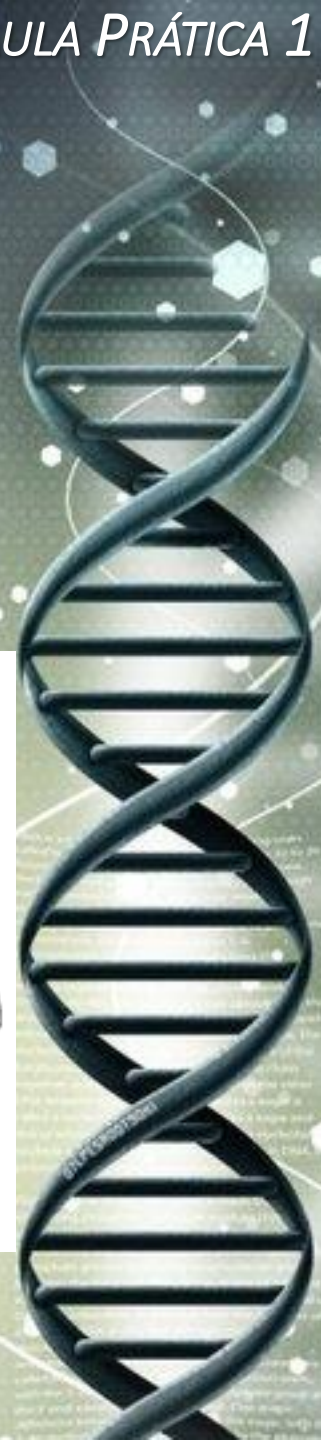
BEZAFIBRATE (MARKETED AS BEZALIP AND VARIOUS OTHER BRAND NAMES) IS A FIBRATE DRUG USED AS A LIPID-LOWERING AGENT TO TREAT HYPERLIPIDAEMIA. IT HELPS TO LOWER LDL CHOLESTEROL AND TRIGLYCERIDE IN THE BLOOD, AND INCREASE HDL.



random][pLasatd

copying structures of DNA into the RNA, a process called transcription.

Within cells, DNA is organized into long strands called chromosomes. These chromosomes are duplicated before cells divide in a process called mitosis. Eukaryotic organisms possess their DNA in the nucleus and some of their DNA is located in mitochondria and chloroplasts.



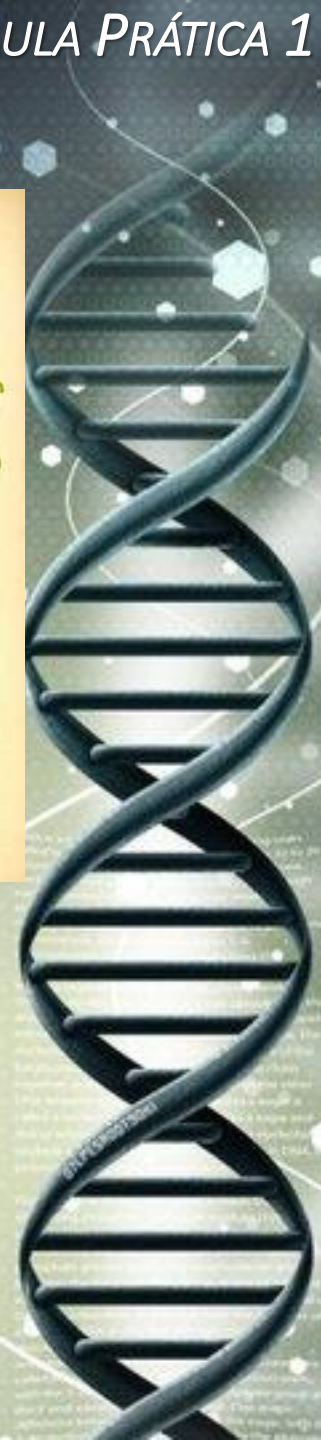


ORGANISMOS TESTE



**BRASSICA JUNCEA**

**SALICORNIA EUROPEA**









*TRABALHOS EM CURSO E PRESPECTIVAS DE MESTRADO*

*CLIMATE CHANGE IMPACTS IN MARINE SYMBIOTIC ORGANISMS/PLANTS*

*NANOTOXICOLOGY IN FISHES AND INVERTEBRATES*

*PHARMACO-TOXICOLOGY IN MARINE PLANTS AND MICROALGAE*

*STRESS PHYSIOLOGY IN ANTARTIC DIATOMS ISOLATED IN TOXIC ENVIRONMENTS*

random][pLasatd

