

*Topic:*  
*Irritable bowel syndrome*  
*Medical Information Systems Course*

**BY: NILOOFAR SHOKRANEH**  
**UNDER SUPERVISION OF DR PEYMAN KEYHANVAR**  
**MEDICAL INFORMATION SYSTEMS COURSE**



# WHAT IS IBS?



**IBS (Irritable Bowel Syndrome)**

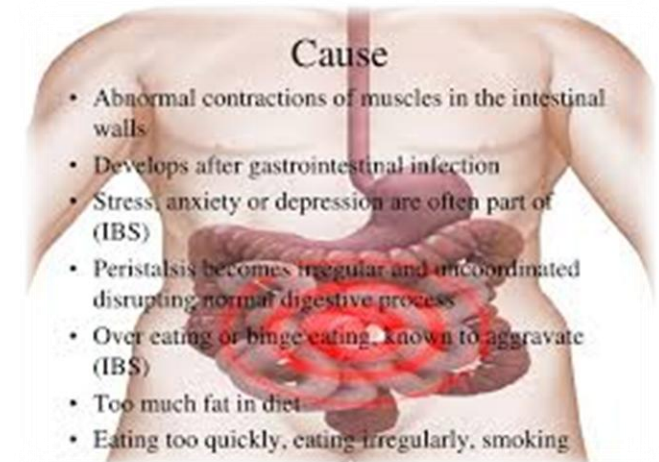
**Signs and Symptoms**

- Cramping
- Abdominal pain
- Bloating
- Gas
- Diarrhea or Constipation, or Both

**Self Care**

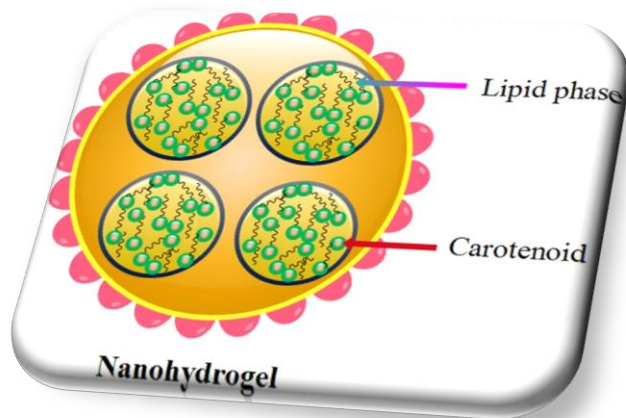
- High Fiber Diet
- Avoid Caffeine
- Drink Plenty of Water
- Physical Exercise
- Manage Stress

Komal Patel's **DIET STUDIO**



# NANOSTRUCTURE

We use polymer base Nano Hydrogels because they can control the amount of water in bowel and in the other hand we can trap antispasmodic drug for decreasing patient's pain.



# TYPE OF LABORATORY ANIMAL

We will use white mice because:

They are small and their handling is easy

It takes up little space

It has a high generation increase

It is genetically and physiologically close to humans

It costs little to maintain



# INVIVO METHODOLOGY

After designing a nanosystem that is herbal antispasmodic that traps in polymeric nano hydrogels and then we make an emulsion to have a cohesive nanodrug , This nanosystem will be fed to mice because the easiest and most correct way to prescribe gastrointestinal drugs is oral method.



# INVIVO METHODOLOGY

We have 4 groups :

Control group , mice without any drug

Mice with Nanohydrogels prescription

Mice with herbal antispasmodic prescription

Mice with herbal antispasmodic traps in Nanohydrogels prescription



# INVIVO METHODOLOGY

To get better reasons and understand acute and chronic affect of drugs and nanosystems we should wait for 48h.

If after 4h we don't observe any acute reaction or allergic reaction in mices we find out we don't have acute affect

We should be aware about acidic environment of stomach , because of that we should have Azo link on our Nanohydrogels because we have Azoreductase enzyme in bowel and it will open just in bowel with that strategy that was introduced



# GUIDELINES FOR ETHICAL CONSIDRATION

1. Respect for animals' dignity
2. Responsibility for considering options (*Replace*)
3. The principle of proportionality: responsibility for considering and balancing suffering and benefit
4. Responsibility for considering reducing the number of animals (*Reduce*)
5. Responsibility for minimising the risk of suffering and improving animal welfare (*Refine*)





- 6. Responsibility for maintaining biological diversity
- 7. Responsibility when intervening in a habitat
- 8. Responsibility for openness and sharing of data and material
- 9. Requirement of expertise on animals
- 10. Requirement of due care



## Ethical Consideration in Animal Research

- Some animal rights and animal welfare advocates are trying to justify that it is not necessary to involve animals in research while some groups of researchers would say that it is better to use animals to minimize the harm for human beings.

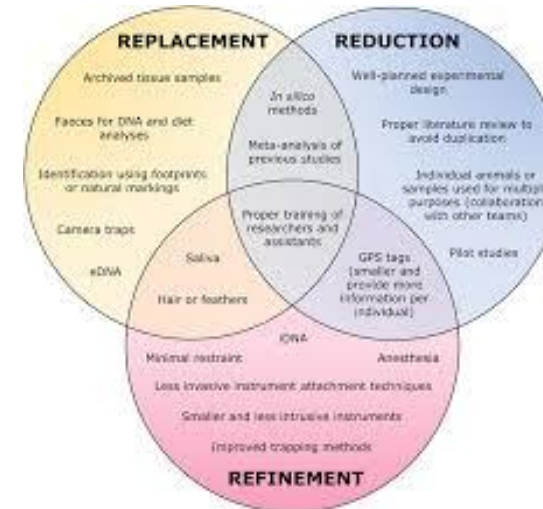


Arguments For	Arguments Against
Clinical Trials Stage 1 involves animals. Without animals we would not be able to discover new drugs.	Why not use computer simulations in Clinical trials instead?
Animal testing is better than nothing and does, in some cases, avert potential loss of human life	Animal physiology is different to human physiology. Animal testing is, therefore, unhelpful.
<b>Utilitarian argument:</b> Animal testing is for the greater good.	Animals have rights too.
Machines like the MRI were invented using animals.	Animals have no <b>informed consent</b> .
Animal testing has advanced our understanding of human physiology.	Testing on animals when the potential side-effects are unknown is immoral.
	Animals can't tell you when they are suffering.
	Animals are often poorly cared for in labs.





If animals were to be used in experiments, every effort should be made to Replace them with non-sentient alternatives, to Reduce to a minimum the number of animals used, and to Refine experiments which used animals so that they caused the minimum pain and distress.



## ANIMAL RESEARCH : researchers place a high priority on "The Three Rs".

Of the **98** Nobel Prizes awarded for Physiology or Medicine, **75** were directly dependent on animal research.  
<http://speakingofresearch.com/facts/the-animal-model/>

We share approximately **99%** of our DNA with mice.  
<http://speakingofresearch.com/facts/the-animal-model/>

### REDUCTION:

Any strategy that will result in fewer animals being used in research.



### REPLACEMENT:

Methods which avoid or replace the use of animals in research

Immunizations against **polio, diphtheria, mumps, rubella and hepatitis** save countless lives.

[http://www.mofed.org/Animal\\_Research.htm](http://www.mofed.org/Animal_Research.htm)

### REFINEMENT

Modification of experimental procedures in order to minimize pain.  
A Time Out for the Mice: Szczepan Baran <http://www.mendelspod.com/podcast/a-time-out-for-the-mice-szczepan-baran>

**95%** of all lab animals are specialty-bred rats and mice.

<http://speakingofresearch.com/facts/the-animal-model/>

**"Thanks to animal research, many diseases that once killed millions of people every year are either treatable or have been eradicated altogether."** Frankie L. Trull President of Foundation of Biomedical Research [http://www.mofed.org/Animal\\_Research.htm](http://www.mofed.org/Animal_Research.htm)



# PHYSIOLOGICAL CHARACTERISTIC OF WHIT MICE

**Composition of plasma:** Mouse plasma is composed of water, proteins, salts, and other solids in solution. Its major constituent is water

**Blood volume:** Even though blood volume is influenced by many things, it is reasonably constant under normal laboratory conditions, being estimated at 5.5 ml/100 g of body weight for adult

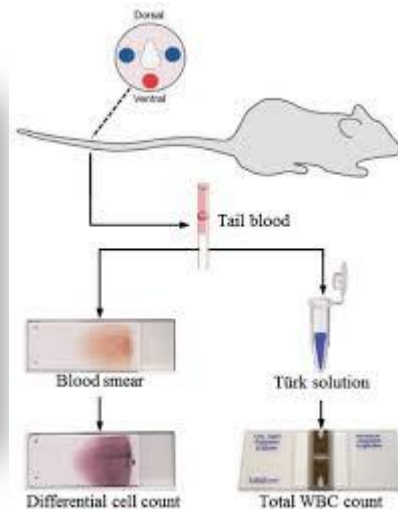
**Blood pH:** 7.302 to 7.336

**Water balance:** estimated that a 21-g albino mouse turns over 4.28 ml water per day. Water intake averages 2.12 ml and metabolic water amounts to 2.16 ml

**Density of urine:** For example, 4-month-old females of strain MA drank on the average 5.6 ml of water per day and excreted 2.9 ml urine per day (total solid concentration of 9.7 per 100 g)



# BLOOD SAMPLING



# BLOOD SAMPLING

In a blood sampling, we take a maximum of 10% of our mouse blood, which is approximately 1/4ml , more over it causes the death of mice.

If a large amount of blood is needed and the animal can be removed after blood sampling we can do it with deep anesthesia with needle head number 24 on the left side of the chest between the fifth and sixth ribs.



# BLOOD SAMPLING

Surgical techniques:

Blood vessel cannulation , Tail snip

Non-surgical techniques:

Tail vessel microsampling , Tail vein , Saphenous vein

Terminal techniques:

Retro orbital , Abdominal\ thoracic blood vessel , Cardiac puncture , Decapitation , Schedule stunning and decapitation





# HOLDING AND HANDLING MICE

Laboratory mice are routinely handled for husbandry and scientific procedures. Traditionally mice are initially picked up by the base of the tail, sometimes with a hand positioned to support the animal's body.

Research has shown that picking up mice by the tail induces aversion and high anxiety levels, as assessed by a range of measures, which can be minimised by instead using a tunnel or a cupped hand.



THANKS FOR YOUR ATTENTION

