ANIMALS FOR HEALTH RESEARCH

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MAN DEPENDED ON ANIMALS FOR SURVIVAL

- Food: Cattle, Sheep, Pig, Poultry
- COMPETITION AND COMPANION SHIP
- ACQUISITION OF KNOWLEDGE

  (Galen 129-200 AD - Wild deer, Artery contained blood not air)

RESEARCH IN ANIMALS OVER 100 YEARS LEAD TO

- Understanding of the basic functioning of mammalian physiology
- Causes and process of disease
- Mechanism of infectious diseases & immunity & Non-communicable diseases
- Methods to prevent them
- Discovery of nutrients, anti-nutrients, non-nutrients, toxicants, antidotes, drugs etc.
- Finally to help human & animals lead a relatively better quality of life

DISCOVERIES

1600's	-	Discovery of blood circulation
		Discovery of the function of the lungs
1700's	-	Measurement of blood pressure
1800's	-	Vaccination to stimulate immunity
		Understanding of infectious diseases
1900's	-	Discovery of antibodies
		Understanding of hormone systems
1920's	-	Discovery of vitamins
1930's	-	Discovery of the mechanism of nerve impulses
		Discovery of tumour viruses

DISCOVERIES (Contd..)

1940's	-	Understanding of embryonic development
1950's	-	Understanding the control of muscle activity
1960's	-	Discovery of monoclonal antibodies
		Understanding the biochemical functions of the liver
1970's	-	Understanding of transplantation antigens
		Understanding the way the brain functions
		Discovery of prostaglandins
1980's	-	Development of transgenic animals
		understanding the basis of memory
1990's	-	Understanding auto immune disorders
		In vitro fertilization, cloning, gene manipulation
2000's	-	Regeneration, stem cells, epigenetics

TRANSLATION OF DISCOVERIES

1920's - Insulin for diabetes

1930's - Modern anaesthetics for surgery, Diphtheria vaccine

1940's - Broad-specturm antibiotics for infections

Whooping cough vaccine

Heart-lung machine for open-heart surgery

1950's - Kidney transplants

Cardiac pacemakers and replacement heart valves

Polio vaccine

Drugs for high blood pressure

Hip replacement surgery

1960's - Corneal transplants

Rubella vaccine

Coronary bypass operations

Heart transplants

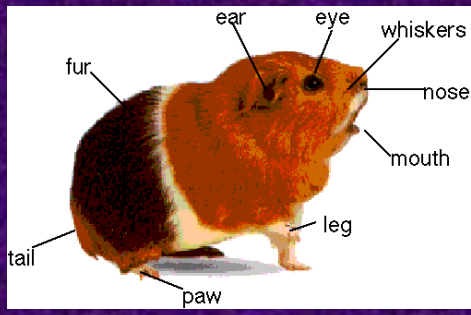
Drugs to treat mental illness

TRANSLATION OF DISCOVERIES (Contd..)

1970's	-	Drugs to treat ulcers
		Improved sutures and other surgical techniques
		Drugs to treat asthma
		Drugs to treat leukaemia
1980's	-	Immunosuppressant drugs for organ transplants
		CAT scanning for improved diagnosis
		Life-support systems for premature babies
		Drugs to treat viral disease
1990's	-	Laproscopic surgical techniques
		Breast Cancer Links
		Gene therapy for cystic fibrosis
2000's	-	Stem cell therapy

LABORATORY ANIMAL

"Man made biological tool, nurtured in a controlled environment. Maintained on a standard diet free from known pathogens and of a defined genetic background"

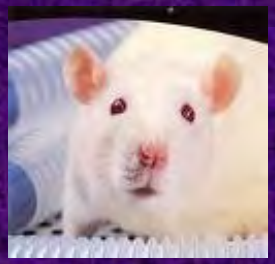


WILD

LABORATORY

MOUSE

RAT



HAMSTER

WILD

LABORATORY

GUINEA PIGS

RABBIT

World of Laboratory Animals

- Do we know everything about disease processes
- Have we conquered all diseases
- Do we have valid alternatives to lab animals
  - In silico - Simulations – Virtual
    – not real
  - In vitro - Single cell responses do not capture other variables
  - Lab animal studies have transformed therapy "Incurable" diseases to completely curable.
  - Facilitated early diagnosis
  - Led to minimally invasive procedures

Why not human models

- Many confounding factors
- Genetic variability
- Phenotypical variability
- Environmental variability
- Cloned humans could be future "Lab animals"

Until then……

FUTURE AGENDA

- Developmental origins of adult health & disease - for better management
- Cancer biology & therapy
- Early biomarkers of pathological processes
- Validation of alternatives to animal models

Thank you