SOUTH CALCUTTA GIRLS' COLLRGE

ACADEMIC CALENDER

FIRST SEMESTER

PHILOSOPHY HONOURS PHI-A-CC-1 INDIAN PHILOSOPHY

SEPT.20	NO. OF DAYS	OCT.20	NO. OF DAYS	NOV.20	NO. OF DAYS	DEC. 20	NO. 0F DAYS	JAN 20	NO. OF DAYS	FEB 21	NO. OF DAYS	MARCH 21
A INTRODUCTION: DIVISION OF INDIAN PHILOSOPHICAL SCHOOLS: ĀSTIKA AND NĀSTIKA B CĀRVĀKA SCHOOL-EPISTEMOLOGY, METAPHYSICS AND	19	C JAINISM-CONCEPT OF SAT, DRAVYA, PARYĀYA, GUṆA, ANEKĀNTAVĀDA, SYĀDVĀDA AND	12	D BUDDHISM-FOUR NOBLE TRUTHS, THEORY OF DEPENDANT ORIGINATION: PRATĪTYASAM-UTPĀDAVĀDA	5	DEFINITION OF REALITY: ARTHAKRIYĀKĀRIV-AMSATTVAM, DOCTRINE OF MOMENTARINESS: KṢANABHANGAVĀDA, THEORY OF NO-SOUL:	18	E NYĀYA: PRAMĀ AND PRAMĀṆA PRATYAKṢA AND ITS CLASSIFICATIONS F ANUMITI ANUMĀNA	21	UPAMĀNA, ŚABDA G VAIŚEṢIKA-SEVEN PADĀRTHAS REVISION	16	FINAL EXAMINATION

ETHICS		SAPTABHAN-GINAYA				NAIRĀTMYAVĀDA FOUR SCHOOLS OF BUDDHISM: BASIC TENETS		AND CLASSIFICATION		INTERNAL AND TUTORIAL EXAMINATION		

PUJA VACATION: MID-OCTOBER – MID-NOVEMBER 2020

FIRST SEMESTER

PHILOSOPHY HONOURS PHI-A-CC-2 HISTORY OF WESTERN PHILOSOPHY-1

SEPT.20	NO. OF DAYS	OCT.20	NO. OF DAYS	NOV.20	NO. OF DAYS	DEC. 20	NO.0F DAYS	JAN.21	NO. OF DAYS	FEB 21	NO. OF DAYS	M
A PRE-SOCRATIC PHILOSOPHY: THALES, HERACLITUS, PARMENIDES, EMPEDOCLES ANAXAGORAS, DEMOCRITUS, PROTAGORAS B PLATO: THEORY OF KNOWLEDGE AND THEORY OF FORMS	19	C ARISTOTLE: CRITIQUE OF PLATO'S THEORY OF FORMS, DOCTRINE OF FOUR CAUSES, FORM AND MATTER	12	D. ST. THOMAS AQUINAS: FAITH AND REASON, ESSENCE AND EXISTENCE	5	E. DESCARTES: METHOD OF DOUBT, COGITO ERGO SUM, CRITERION OF TRUTH, MIND-BODY DUALISM, PROOFS FOR THE EXISTENCE OF GOD AND EXTERNAL WORLD.	18	F SPINOZA: DOCTINE OF SUBSTANCE, ATTRIBUTES, MODES, EXISTENCE OF GOD, PANTHEISM, THREE ORDERS OF KNOWING	21	G LEIBNITZ: MONADOLOGY, TRUTHS OF REASON AND TRUTHS OF FACT, SOME METAPHYSICAL PRINCIPLES. REVISION INTERNAL AND TUTORIAL EXAMINATION	16	EXA
PUJA VACATION MID OCT-MID NOV.20												

PHILOSOPHY GENERAL

PHI-G-CC-1

INDIAN EPISTEMOLOGY AND METAPHYSICS

SEPT.20	NO. OF DAYS	OCT.20	NO. OF DAYS	NOV.20	NO. OF DAYS	DEC. 20	NO. OF DAYS	JAN.21	NO. OF DAYS	FEB 21	NO. OF DAYS	MARCH 21
INTRODUCTION A CĀRVĀKA EPISTEMOLOGY	19	B NYĀYA EPISTEMOLOGY: NATURE OF PERCEPTION	12	B (CONT) ANUMĀNA	5	ANUMĀNA: ITS FEATURES AND CLASSIFICATIONS	18	C VAIŚEŞIKA METAPHYSICS	21	D ADVAITA VEDĀNTA METAPHYSICS REVISION	16	FINAL EXAMINATION
										INTERNAL AND TUTORIAL EXAMI NATION		

										REVISION INTERNAL AND TUTORIAL EXAMINATION		

2. ACADEMIC CALENDAR FOR EVEN SEMESTERS (APRIL 2021-AUGUST 21)

SECOND SEMESTER

PHILOSOPHY HONOURS

PHI-A-CC-3

OUTLINES OF INDIAN PHILOSOPHY II

APRIL 21	NO. OF DAYS	MAY 21	NO. OF DAYS	JUNE 21	NO. OF DAYS	JULY 21	NO. OF DAYS	
A SĀMKHYA---- PRAKṚTI, PURUṢA-NATURE, PROOFS OF EXISTENCE, THEORY OF EVOLUTION	23	B YOGA- CITTA, CITTAVṚTTI, CITTABHŪMI, EIGHT- FOLD PATH OF YOGA, GOD	23	D ADVAITA VEDĀNTA: SANKARA'S THEORY OF BRAHMAN	26	E VIŚISTĀDVAITAVĀDA: RĀMĀNUJA'S THEORY OF BRAHMAN	14	FINAL THEORY EXAMINATION
		C MIMĀMSĀ THEORY (PRĀVĀKARA AND BHĀTTA SCHOOLS AND THEIR IDEAS					INTERNAL AND TUTORIAL EXAMINATION	

PHI-A-CC-4

HISTORY OF WESTERN PHILOSOPHY-II

APRIL 21	NO. OF DAYS	MAY 21	NO. OF DAYS	JUNE 21	NO. OF DAYS	JULY 21	NO. OF DAYS	
A LOCKE: THEORY OF IDEAS, SUBSTANCE, KNOWLEDGE REPRESENTATIVE REALISM	23	B BERKELEY: REFUTATION OF ABSTRACT IDEAS, IMMATERIALISM, ESSE- EST- PERCIPI, IDEA OF GOD	23	C HUME: IMPRESSIONS AND IDEAS, CAUSALITY, SELF, SCEPTICISM	26	D KANT: CONCEPTIONS OF CRITICAL PHILOSOPHY, DIFFERENT KINDS OF JUDGMENT, COPERNICAN REVOLUTION IN PHILOSOPHY, SPACE AND TIME.	14	FINAL THEORY EXAMINATION
							INTERNAL AND TUTORIAL EXAMINATION	

PHILOSOPHY GENERAL

PHI-G-CC-2

WESTERN EPISTEMOLOGY AND METAPHYSICS

APRIL 21	NO. OF	MAY 21	NO.	JUNE 21	NO. OF	JULY 21	NO. OF DAYS	

	DAYS		OF DAYS		DAYS			
A DIFFERENT SENSES OF "KNOW" CONDITIONS OF PROPOSITIONAL KNOWLEDGE, ORIGIN OF CONCEPTS: CONCEPT RATIONALISM AND EMPIRICISM	23	B THEORIES OF THE ORIGIN OF KNOWLEDGE: RATIONALISM, EMPIRICISM, KANT'S CRITICAL THEORY	23	C REALISM D CAUSALITY	26	E MIND-BODY PROBLEM: DIFFERENT THEORIES	14	FINAL THEORY EXAMINATION
							INTERNAL AND TUTORIALEXAMINATION	

ACADEMIC CALENDAR
Department of Mathematics
CC2: Mathematics
[Theory]
Total number of teaching lectures = 75

Unit		Month									
	Topics and subunits	**January**	**February**	**March**	**April**	**May**				**June**	
						1st week	**2nd week**	**3rd week**	**4th week**	**1st week**	**2nd week**
Prof P.R	**Differential Calculus-II**							**Internal Assessment**	**Tutorial exam**	**Study Leave for first semester exam**	**1st Semester theoretical exam**
	1. Sequence of real numbers :	4									
	2. Infinite series of constant terms; Convergence and Divergence	2	1								
	3. Real-Valued functions defined on an interval		2								
	4.Indeterminate Forms : L'Hospital's Rule : Statement and Problems only.		2	**1**							
	5. Application of the principle of Maxima and Minima		3								
	6. Lagrange's Method of undetermined multiplier			**2**							
Prof P.R	**Differential Equation**										
	1. Linear homogeneous equations with constant coefficients	3		2							
	2. Order and degree of partial differential equations	3									
Prof P.R	**Vector Algebra**										
	1. Addition , Multiplication . Collinear and Coplanar Vectors. Scalar and Vector products. Simple applications to problems of Geometry. Vector equation of plane and straight line. Volume of Tetrahedron.		**3**	**4**	**2**						
Prof P.R	**Discrete Mathematics**										
	1.Integers : Principle of Mathematical Induction. Division algorithm	**3**		1							
	2. Congruences : Congruence relation on integers, Basic properties of this relation. Linear congruences,Chinese Remainder Theorem		**2**	2	3						
	3. Application of Congruences		**1**	2							
	4. Congruence Classes			2	2						
	5.Boolean Algebra Boolean function and logic gates			3	1						

ACADEMIC CALENDAR
Department of Mathematics
CC1: Mathematics
[Theory]
Total number of teaching lectures = 75

Unit		Month									
	Topics and subunits	**June**	**July**	**August**	**September**	**November**				**December**	
						1st week	**2nd week**	**3rd week**	**4th week**	**1st week**	**2nd week**
1 Prof P.R	**Algebra 1**							**Internal Assessment**	**Tutorial exam**	**Study Leave for first semester exam**	**1st Semester theoretical exam**
	1.Complex Numbers : De Moivre's Theorem and its applications.	4									
	2.Exponential, Sine, Cosine and Logarithm of a complex number. Definition of a z (a 6= 0). Inverse circular and Hyperbolic function	2	1								
	3. Polynomials : Fundamental Theorem of Algebra (Statement only). Polynomials with real Coefficients		2								
	4.Theory of equation ,relation between coefficient and roots		2								
	5.Solution of cubic equation by cardan's method		3								
	6 .Mateix and its application			**2**							
2 Prof P.R	**Differential Equation 1**										
	1. Basic idea of ordinary differential equation			1							
	2. First order exact differential equation				2	1					
	3.First order linear differential equation			1	1						
	4.Clairaut's form				2						
	5.solve 2nd order differential equation ,complementary function ,constant coefficients				3	1					
	6.Homogeneous differential equation				2						
	7.Method of undetermined coefficients				3						
	8.Variation of parameters				1	2					
3. Prof P.R	**Coordinate geometry**										
	1.Transformation	**2**									
	2. Pair of straight lines	**3**									
	3.Tangent to a conic,chord of contact		**3**								
	4.Poles and polars	**2**		**3**							
	5.General equation of 2nd degree			**1**	**2**						
	6.Polar equation				**3**						
	7.3D Planes and straight lines				**2**	2					
	8.The sphere					3					
	9.Right circular cone				**1**		2				

Prof P.R	**Differential calculus 1**										
	1.Real number ,real valued function		**2**								
	2.Limit of function.	**1**		2							
	3.Continuity			1							
	4.Derivative			1	1						
	5.Leibntz's theorem and higher order derivative			1							
	6.Application of differential calculus ,Curvature,Asymptote,Envelop,Singular point			1	2						

Assignment - 2 (20/1/21)

(1) **Complementation** → The genetic phenomenon that is involved with the production of wild phenotype of 2 different mutations at different regions of chromosome & combine in heterotype is called complementation.

The complementation occurs in 2 conditions —

(a) When 2 mutations occur at 2 genes or loci → They can produce wild phenotype both at cis-heterozygous & trans-heterozygous test.

(b) When 2 mutations occur with same genes → They cannot complement trans-arrangement but can only complement in cis-arrangement.

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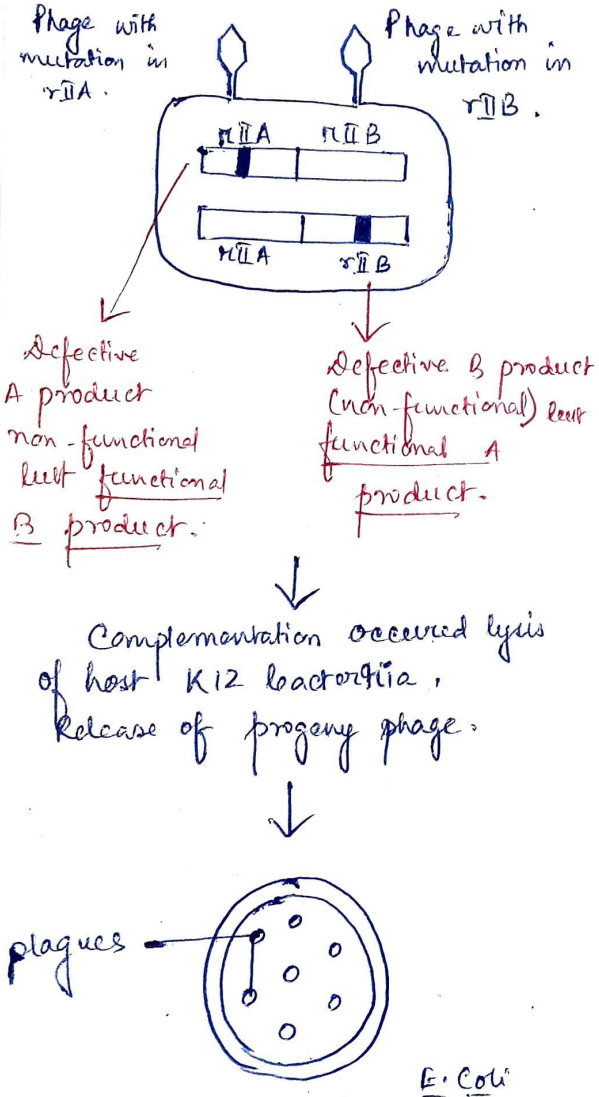
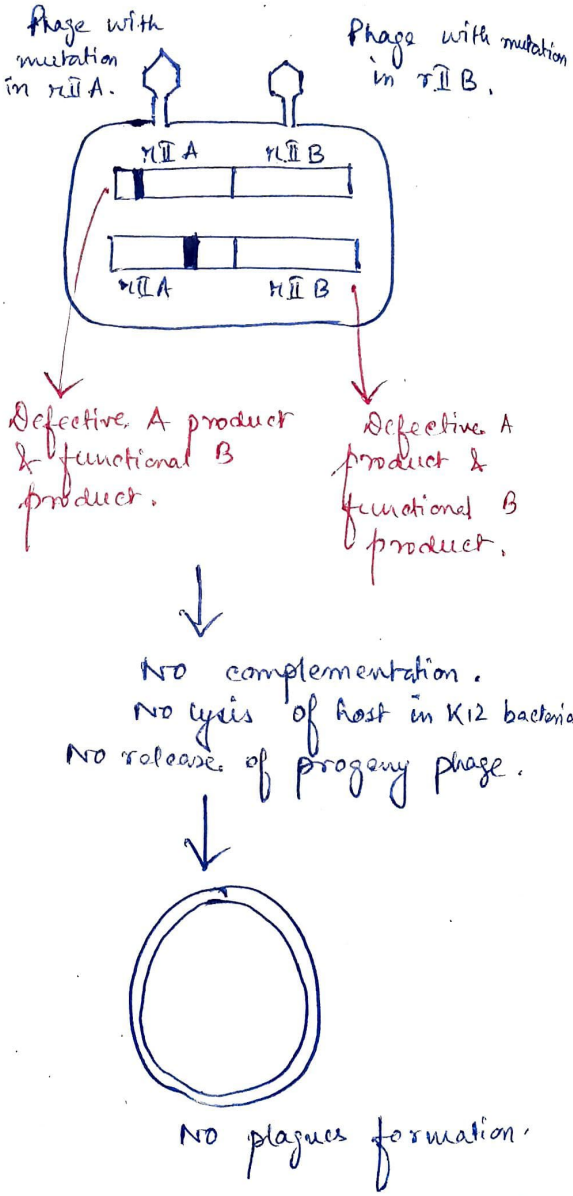
(2)





(3) Extra chromosomal inheritance → A non-mendelian pattern of inheritance governed by the DNA present in the cytoplasm is known as extrachromosomal inheritance. The extra chromosomal inheritance is also known as cytoplasmic inheritance. or non-mendelian inheritance. It was first reported by Boris Ephrussi in yeast during 1949.

One of the classic example of extra-chromosomal inheritance is the shell spiralling in snail. The opening of the shell that has been observed is that in one strain the shell always coils to the left (sinistral) whereas in the other strain the shell always coils to the right (dextral)

In a cross between dextral female & sinistral male, it produces dextral snails in F_1 as well as in F_2.

But in a cross between sinistral female & dextral male, all the snails in F_1 are sinistral & in F_2 all the snails are dextral.

Cross 1

P_1 Right coil (X) left coil

↓

F_1 All right coil

↓

F_2 All right coil

↓

F_3 3 right coil : 1 left coil

Cross 2

Left coil (X) right coil

↓

All Left coil

↓

All right coil

↓

3 right coil : 1 left coil

20/1/22

CC12 Assignment

① What is complementation? When does it occur?

A genetic phenomenon that is involved with the production of a wild phenotype when two different mutations at different regions of the chromosome combine in a heterozygote is known as complementation. The test that is designed to study whether two mutations can complement or not is called Complementation Test or cis-trans Test.

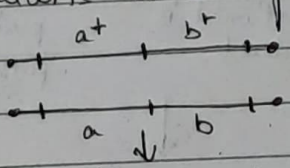
Criteria for the occurence of complementation :-

i) When two mutations occur at two genes or loci - They can produce both wild phenotype both at cis heterozygotes and trans heterozygote state because at each locus there is a wild allele against a mutant allele and thus each locus produces a normal phenotype. Thus complementation occurs at both cis and trans state.

ii) When two mutations occur at the same gene - Complementation occurs only in cis arrangement but not in trans arrangement. The trans arrangement affect both allele and thus they do complement.

Cis heterozygote

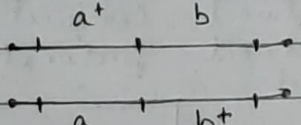
i) Two mutations at two genes -



a^+b^+

normal complementation.

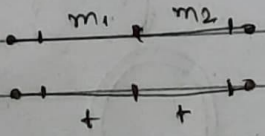
Trans heterozygote



a^+b^+

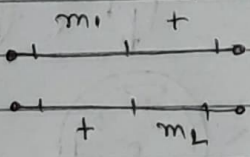
normal complementation.

ii) Two mutations ~~at~~ on the same gene -



intragenic cis arrangement

complementation occurs



intragenic trans arrangement.

No complementations

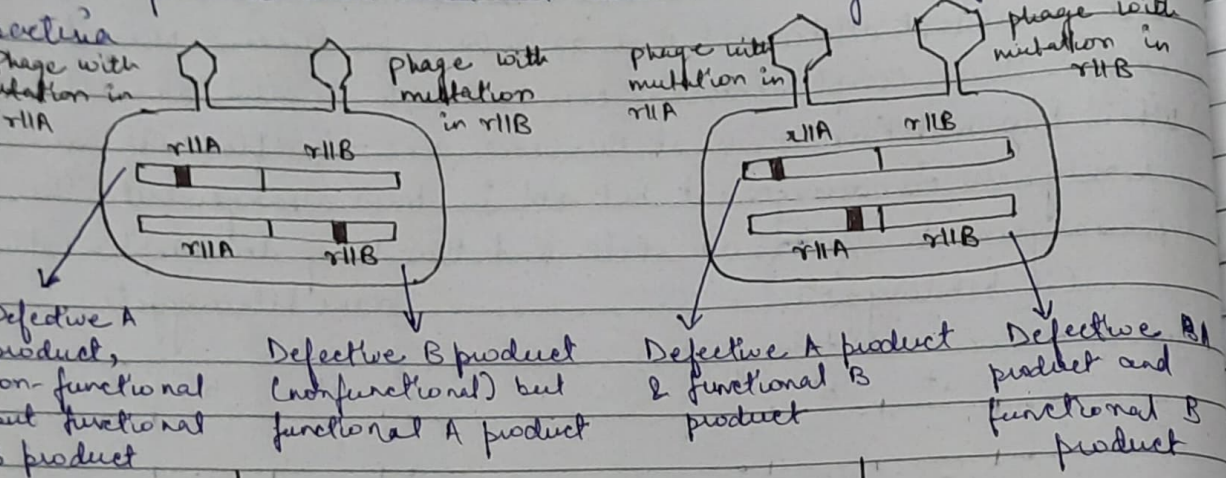
② How did Benzer tested complementation in bacteriophage? Explain schematically?

Samples of two phages of rII mutants to be tested were spread over host E. coli K_{12} bacteria. High ratio of phages were given to ensure that every bacterium is infected with phages. After

a period of incubation, the growth or absence of the bacteria indicate whether or not the bacteria have lysed as a result of phage infection.

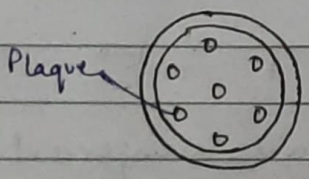
If E. coli K12 is coinfected with two rII mutants, one with rIIA mutation, then complementation will result as rIIA mutant provides functional B product and non-functional A product while rIIB mutant produces no non-functional B product and functional A product.

If two mutations are in rIIA cistron, then A product will be non-functional but B product will be wild type. Then complementation will not occur causing no lysis of bacteria

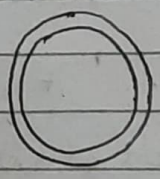


Complementation occured
Lysis of host K12 bacteria.
Release of progeny phage.

No complementation.
No lysis of host K12 bacteria
No release of progeny phage.



T4 plaques grown on E. coli K12 bacteria



No plaque formation

Trans arrangement in different cistron.

Trans arrangement in same cistron.

② Define extrachromosomal inheritance? Elaborate it in terms of shell spiralling in snail snail.

A non-mendelian pattern of inheritance governed by the DNA present in the cytoplasm is known as extrachromosomal inheritance. Nuclear DNA is the basis for inheritance of almost all type of phenotype. It is inherited in a particular fashion from parent to offspring. Though all genes are inherited in Mendelian style, some genes present in the cytoplasm inherit in a non-mendelian pattern and this type of inheritance is extrachromosomal inheritance.

Maternal effect (a type of extrachromosomal inheritance) is evident in the coiling direction of the shell in snail Limnaea peregra. The shell coiling is determined by a single pair of nuclear alleles: the dominant D allele for coiling to the right (dextral coiling) and the recessive d allele for coiling to the left (sinistral coiling). The shell coiling phenotype is always determined by the genotype of the mother. When inbreeding, dextral coiling and sinistral coiling snail are crossed, all the F_1 snails have the same genotype because a nuclear gene is involved, yet phenotype is different (all the snails are dextral in phenotype). Mum donors that are DD or Dd produce only dextrally coiled progeny. Maternal parents that are dd produce only sinistrally coiled progeny. The coiling pattern is determined by the genotype of the parent producing the egg, regardless of the phenotype of that parent. The females that are either DD or Dd produce oocytes that synthesize D gene product, which is stored in the ooplasm. Even if the oocyte contains only the d allele following meiosis and is fertilized by a d-bearing sperm, the resulting dd snail will be dextrally coiled (right handed).

SOUTH CALCUTTA GIRLS' COLLEGE

72, Sarat Bose Road, Kolkata-700025

NAAC Accredited B++

INTER-COLLEGE ONLINE POSTER COMPETITION

On

Discovery of Insulin: A Revolutionary Milestone

Through Google Meet

Organized by

Department of Zoology

Date: 10th July, 2021. Time: 1 pm onwards

Patron:
Prof. (Dr.) Aparna De
Principal & Secretary
South Calcutta Girls' College

INSTRUCTIONS:

- **UG/PG students of any discipline can participate.**
- **Registration is free but compulsory.**
- **Each participant must register within 05.07.2021 through the registration link.**
- **Each participant can submit only one poster.**
- **Name of the participants, Institution, Department and Semester must be written at the bottom right corner of the poster.**
- **Copy of the poster in jpg. format is to be sent to scgczooprogramme@gmail.com within 20 MB on or before 7th July midnight.**
- **Scanned copy is applicable only for handmade posters.**
- **After preliminary screening selected candidates will get a chance to share their thoughts related to the poster within 3-4 minutes.**

MEMBERS OF ORGANISING COMMITTEE

Dr Roni Sarkar
Dr Rajasri Chakraborty
Dr Sudipta Ghosh
Dr Pubali Mitra
Ms Sucheta Bose

3

DIABETES
Care, Connect, Campaign

INSULIN: A REMARKABLE INVENTION

INSULIN MUST BE TAKEN WHEN PRESCRIBED

Produced from pancreas, regulates glucose in blood

No production of insulin by β-cells of pancreas cause Type 1 Diabetes(IDDM)

Sympots- polyuria, polydipsia, polyphagia

Visit a doctor if above symptoms appear

Can be cured with proper diet ,exercise and insulin intake

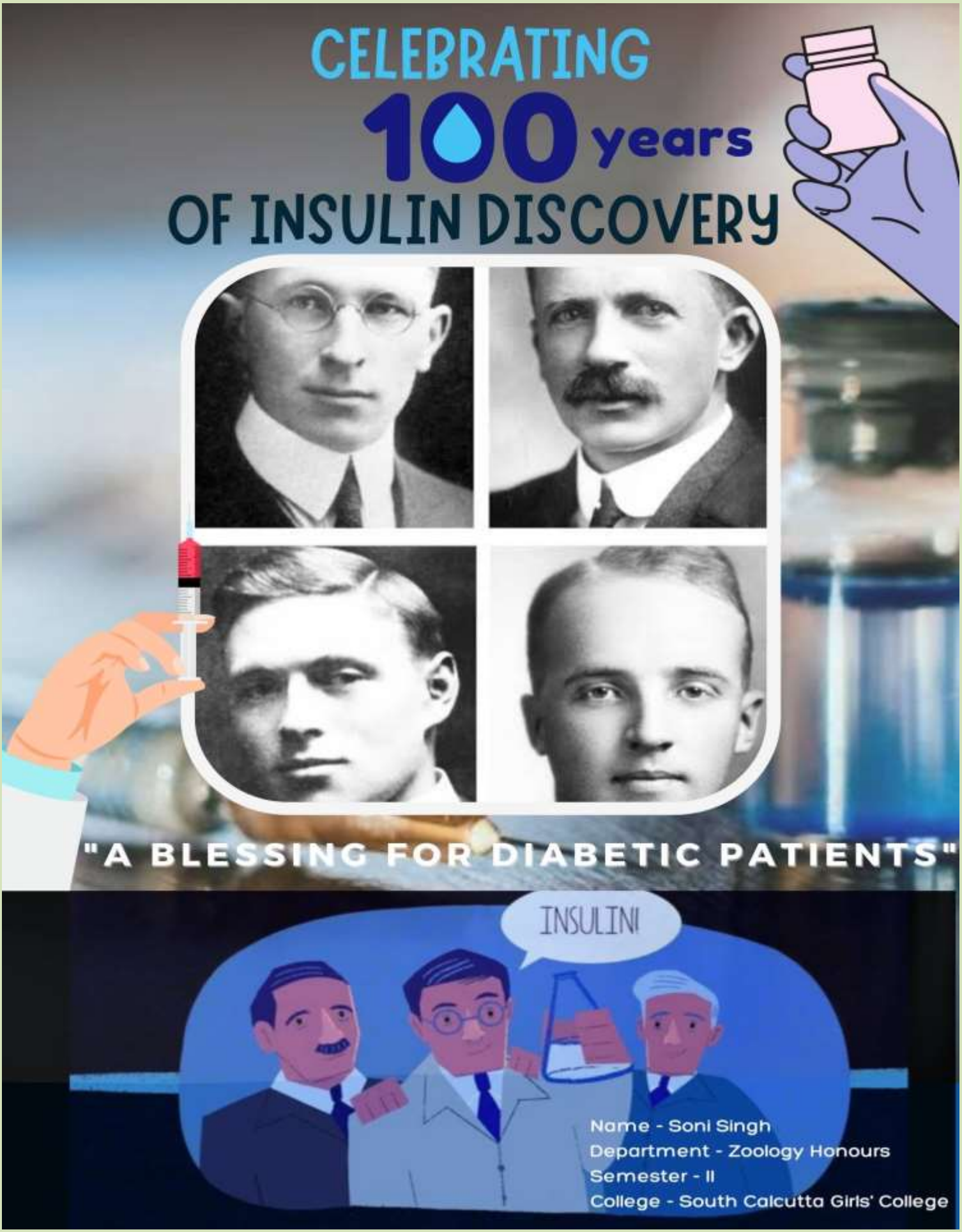
INSULIN DISCOVERY:

ON 11 JANUARY 1922 INSULIN WAS FIRST USED IN THE TREATMENT OF DIABETES. INSULIN WAS DISCOVERED BY SIR FREDERICK G BANTING, CHARLES H BEST AND JJR MACLEOD AT THE UNIVERSITY OF TORONTO IN 1921 AND IT WAS SUBSEQUENTLY PURIFIED BY JAMES B COLLIP

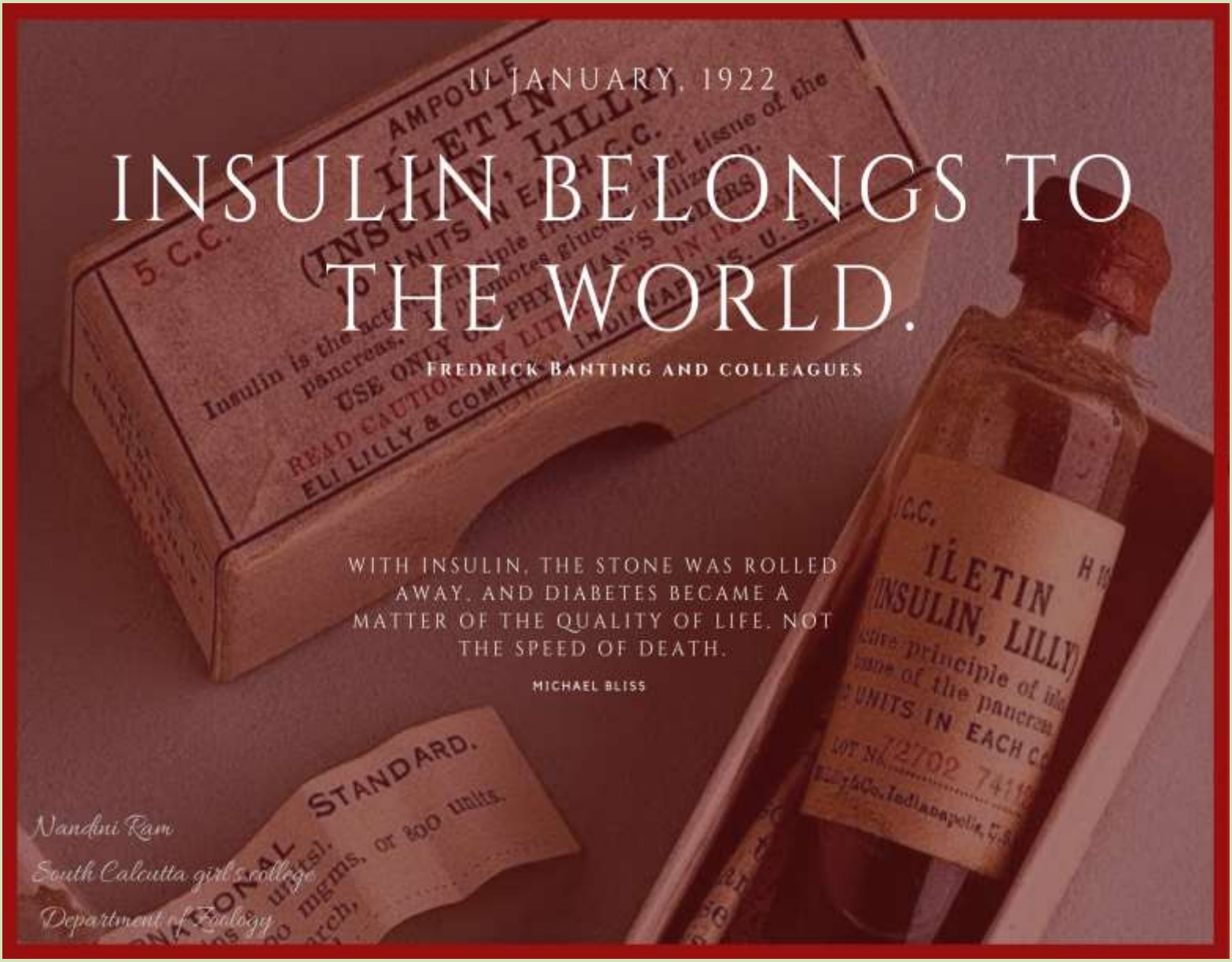
Priti Dalui
Charuchanda College
Zoology Department
2nd semester Zoology Honours

Priti Dalui
Charuchandra College

4



Soni Singh
South Calcutta Girls' College



Nandini Ram
South Calcutta Girls' College

Insulin: A pacesetter for the shape of modern biomedical science

The 100th anniversary of the discovery of insulin in Toronto in 1921 is an important moment in medical and scientific history. Discovery of insulin is a transformative therapeutic activity . In 1889, in Germany, oskar Minkowski and joseph von merting at Strasbourg university reported that removal of pancreas in experimental animals caused sever diabetes mellitus, allowing them to hypothesized that the pancreas contained a substance required for control of blood glucose.

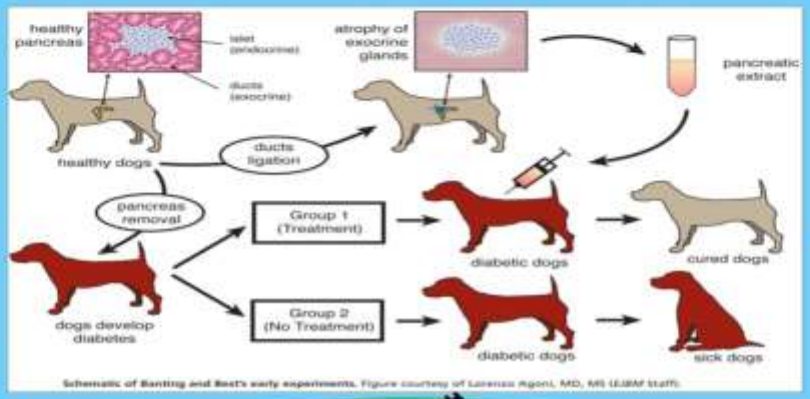
In addition the concept of internal endocrine secretion was developed, with discovery of first hormone Secretin, by Bayliss and Starling, as a result the hypothesis of pancreas produce an internal secretion that contol carbohydrate metabolism become increasingly discussed.

In 1921, four scientists worked to discover, isolate, and purify insulin at the University of Toronto: Frederick Banting, John J. R. Macleod, James B. Collip, and Charles H. Best

In 1921, four scientists worked to discover, isolate, and purify insulin at the University of Toronto: Frederick Banting, John J. R. Macleod, James B. Collip, and Charles H. Best

Frederick Banting was 22 years old, young orthopedic trained as a surgeon rather than as a research scientist. He reads an article ," The Relation of the Islets of Langerhans to Diabetes with Special Reference to Case of Pancreatic Lithiasis", and led to develop an experimental hypothesis that by ligating the pancreatic duct of dogs and wait for degenerate acinal tissue, might then able to xtract the pancreatic factor capable for reversing diabetes and glycosuria.

Under Macleod's supervision, with detailed instructions, Banting and Best begin their experiments. The process proved more difficult than expected: the first few dogs on which they operated died from excessive blood loss and infection. After the scientists improved their surgical technique, they worked on two populations of experimental dogs to account for the endo- and exocrine duality of the pancreas. One set of dogs had to be cured of pancreatic function so as to make them diabetic. These dogs were fully pancreatectomized and became the models for experimentation. The other set of dogs was a living biochemical factory of sorts: their pancreatic ducts were ligated to remove the exocrine capacity of the glands. With the conduit for exocrine secretions removed, the exocrine cells would begin to atrophy, leaving only the endocrine pancreas intact. These dogs were used to harvest the internal secretion that was central to the experimental foundation of Banting and Best's work (Bliss, 1982). When Macleod went on vacation during the summer, he left specific instructions along with information about how to reach Collip, the biochemist whom Banting had briefly met, in case any pressing questions arose.



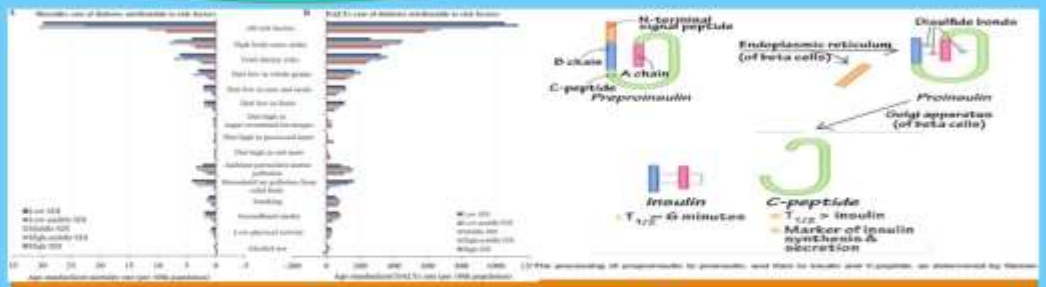
Schematic of Banting and Best's early experiments. Figure courtesy of Lorenzo Agoni, MD, MS (UBMF Staff).

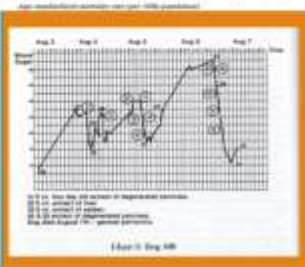
By mid-September, Macleod had returned to Toronto. He was updated on the progress of the Banting and Best experiment, only to find Banting requesting more funding and facilities. Macleod was initially hesitant to provide much additional funding for this project, as it had greatly exceeded the budget he had originally allotted to them, and other research projects would consequently suffer. Banting, convinced of the gravity of the project, was offended that Macleod did not seem to hold it in the same regard. This was the first of many points of contention between the scientist and the surgeon.

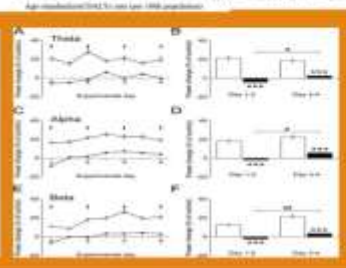
By early July, it was clear that the experiments had fallen short of expectations. Banting and Best had operated on 19 dogs, 14 of which had died, mostly from causes unrelated to the planned experiments (Bliss, 1982). At the end of the month, the pair prepared their first extract of the hypothetical internal secretion from degenerated pancreas that had been ground up and filtered. The filtrate did not cause a decrease in blood sugar in the first dog, but upon further oral administration of sugar, the extract prevented a spike in blood glucose. Further, less sugar was found in the urine. This gave early confirmation that the extract had an effect on these diabetic dogs. Repeated results gave birth to the name "isletin" for the extract (in the experiments' August notes (Bliss, 1982). For a second round of experiments, the pair decided to do complete pancreatectomies on two dogs. The extract was administered to one, and its health was compared with that of the dog that was left untreated. To the delight of the scientists, the control dog was barely able to walk, whereas the experimental dog was in "excellent condition (was not super fond or likely walks about as before operation" (Bliss, 1982; Figure 2). Banting and Best further pursued their experiments, they refined a wide range of methods for obtaining the best possible extract, including using a whole pancreas and even a fetal pancreas.

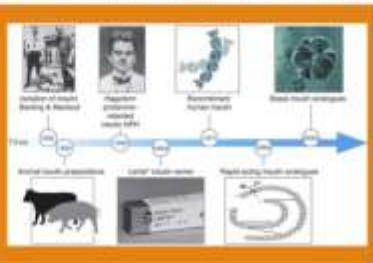
By November 1921, Banting and Best started writing their first paper together. It detailed the results of their experiments from the summer up to that point (Banting and Best, 1922; Bliss, 1982). Why Macleod chose not to put his name on the paper is unclear, but several theories have been posited. After a brief presentation of their work at a journal club on the university campus, the suggestion was made that the next experiment, named the "longevity experiment," should demonstrate that regular administration of the extract could prolong the life of a diabetic dog. It began smoothly and then ended abruptly when the dog began to exhibit twitches and periods of unconsciousness. The dog died within a day. Another "longevity experiment made it clear that impurities in the extract were undermining its curative capacity. In December, Collip began to help the researchers purify their extracts, and by the end of the month, he had prepared an extract that appeared to be medically potent (Bliss, 1982).

After a heated conversation, Macleod ultimately relented, encouraging the pair to delve deeper into their experiments to convince their scientific colleagues of the veracity of their findings. He was specifically interested in an experiment that eliminated the possibility that the decreases in blood sugar were due to a dilution of the blood rather than to the action of the extract. Banting, empowered by the positive results, was more interested in veering off in other directions. At this point, Banting suggested expanding the experimental team. Macleod, however, urged them to continue on their own. Experiments resumed in October (Bliss, 1982









Reference:
i)Bayliss, W.M., Starling, E.H., 1902. The mechanism of pancreatic secretion.
ii)The Journal of Physiology 28(5):325e353.
iii)Hindmarsh, J., 2015. Discovery, interrupted. In: Harpers.
iv)Bliss, M. (1982). The Discovery of Insulin. University of Chicago Press, Chicago

Name- Rahul Pachal
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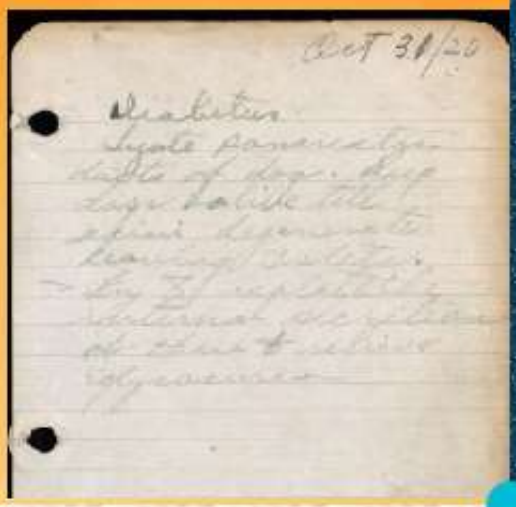
Department- Zoology
Semester IV

Rahul Pachal

Vidyasagar College

Insulin - The Life saver

Discovered by Charles Best and Fredrick Banting in 1921



This note says that: "Ligate pancreatic duct of dog- keep dog alive till acini degenerates leaving Islet- try to isolate the internal secretion of these to relieve glycosuria"

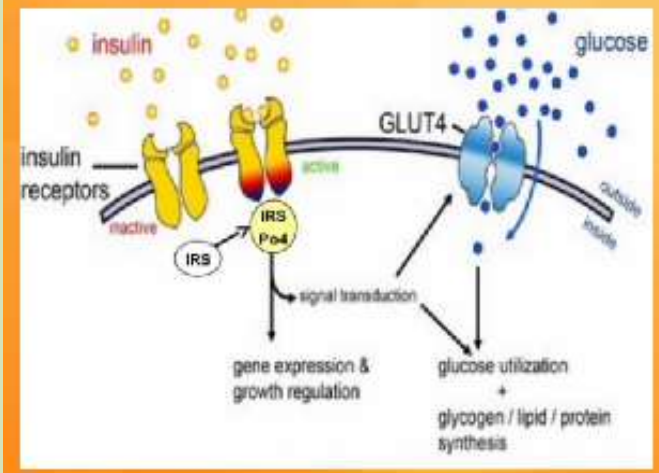
THOUGH INSULIN WAS DISCOVERED IN 1921 BUT THE IDEA OF ISOLATING IT WAS A THOUGHT OF BANTING ON 30 TH OCTOBER 1920

How does it work?

When we take glucose blood sugar level rises.Insulin is taken,which helps to move glucose out of the blood stream and into the cells.Our cells use some sugar as energy and stores rest.Sugar moves into cells & blood sugar level is normal.

USES OF INSULIN

- Infection and ketoacidosis: Short term use
- Long term use is advised in CVS, relinal, renal, neurological conditions etc.
- IDDM: compulsory use
- NIDDM: it is advised
  a. Failure of oral hypoglycaemic agents.
  b. Temporary use in infection, trauma, surgery, pregnancy.



Discovery of Insulin was really a life saver discovery, in the past many people died out of diabetes mellitus but after its discovery, it is under control. It is really a "Revolutionary Milestone".

Made by- Piyali Manna
ZOOA SEM 4
South Calcutta Girls college

Name: Efat Sadia
Institution: Victoria Institution (College)
Department: Botany (Hons)
Semester: 4th

Let's Know about the Insulin

Insulin is a hormone created by pancreas that control the amount of glucose in our blood stream at any given moment.

Insulin was discovered by Sir Frederick G. Banting, Charles H. Best and JJR Macleod at the university of Toronto in 27 July, 1921.

This means that in 2021, we are celebrating 100 years since the discovery of insulin. It was one of the greatest medical breakthroughs in history.

→ If our body does not make insulin or does not make enough we are eventually diagnosed with type 1 diabetes.

Some people have type 1 diabetes. This means that pancreas does not produce insulin.

→ Many people with diabetes who use insulin self administer it by injecting it with a syringe.

1 needle
+ 1 syringe
+ 1 time
1 injection

→ The outside of the syringe is marked with lines denoting the amount of medication in needle.

Efat Sadia
Victoria Institution (College)

c 1550 BCE — Ebers Papyrus : first known description of diabetes called madhumeha

1889 - 1893 — Minkowski, von Mering and Hedon induce diabetes by depancreatizing dogs

1906 - 1911 — Zuelzer reduces glycosuria in a patient but fails reproducible method for pancreatic extraction

1915 - 1919 — Kleiner and Meltzer reduces glycemia in depancreatized dogs with saline extract of Pancreas

1921 - 1922 — Banting and Best later joined by Collip : Nobel prize awarded in 1923

1869 — Langerhans described pancreatic islets

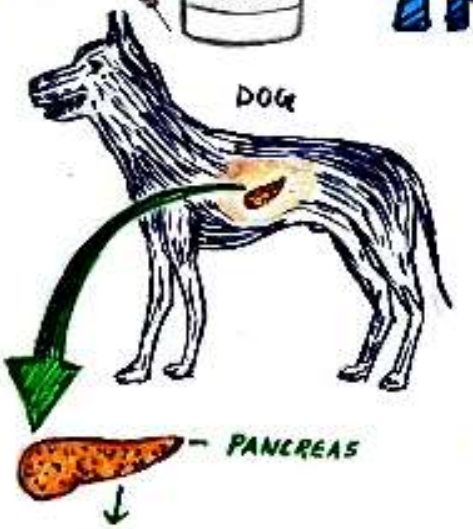
1901 - 1905 — Opie links diabetes to Islet damage

1911 - 1912 — Scott prepares Pancreatic extracts by duct ligation and ethanol extraction

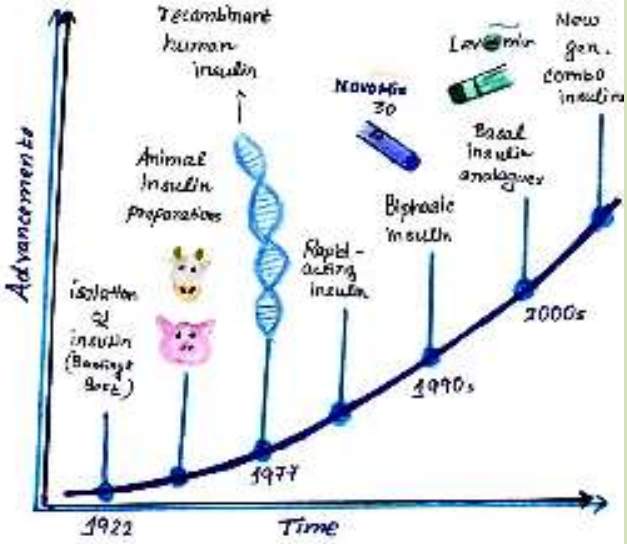
1919 - 1921 — Paulesco decreases glycemia in depancreatized and normal dogs with a salt extract of Pancreas

1958, 1974, 1977 — Nobel prizes awarded to Sanger (1958 : insulin structure) Palade (1974 : hormone secretion) Yallow (1977 : insulin radioimmuno assay)

THE QUEST - "Insula"



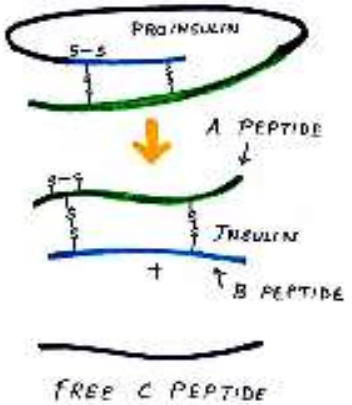
The discovery of insulin has been a milestone that has truly revolutionized both the therapy and prognosis of Diabetes



IN 1921 INSULIN WAS EXTRACTED FROM PANCREAS OF DOG

IN 1983, ELI LILLY AN AMERICAN COMPANY PREPARED HUMAN INSULIN (HUMULIN) BY rDNA TECH

MATURE INSULIN



NAME - POUSUMI MAITY
INSTITUTION - VIDYASAGAR COLLEGE
DEPARTMENT - ZOOLOGY HONS.
SEMESTER - 4

Pousumi Maity
Vidyasagar College

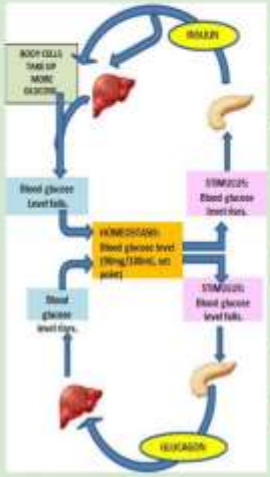
Insulin-A Miracle Life Maker of Millions

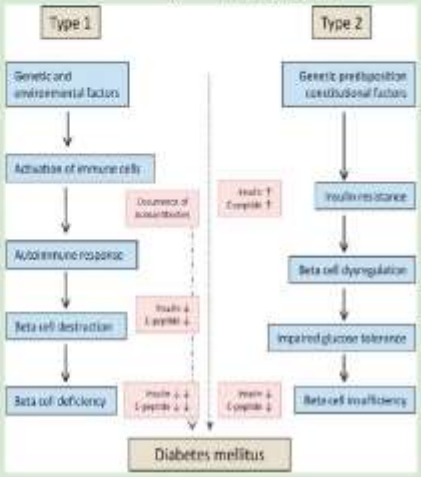
INSULIN:

- Peptide hormone, composed of two polypeptide chain A[21 amino acids] and B [30 amino acids] both of this chains are attached by disulphide bond
- **Secreted from**-Pancreatic β cell
- **Function:**Regulation of blood glucose level

DYSREGULATION OF INSULIN:

★ TYPE 1 DIABETES
★ TYPE 2 DIABETES





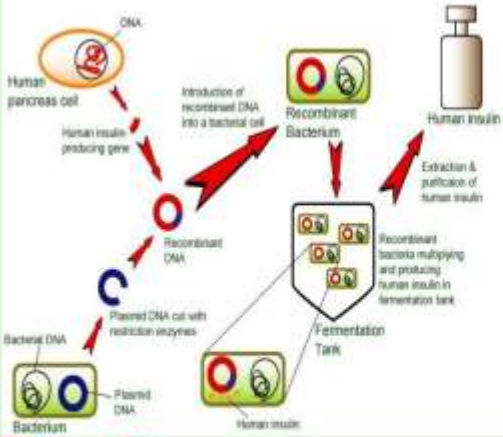
July 27,1921

In 1923 Dr. Frederick Banting and John James Rickard Macleod won Nobel prize both of them share their prize money other two companions

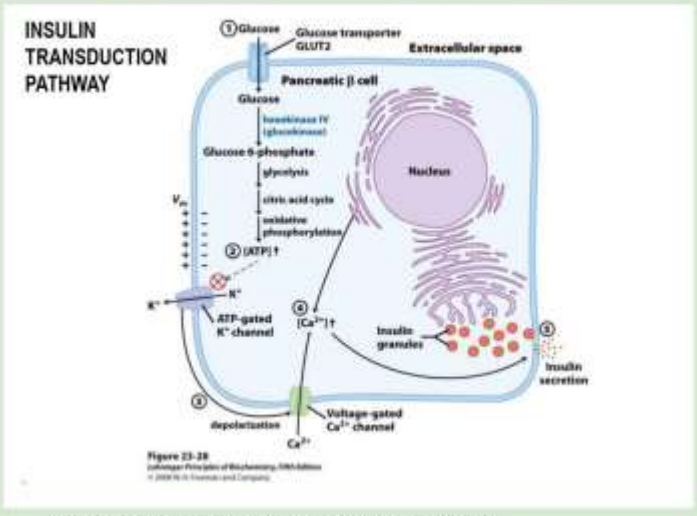
"INSULIN DOES NOT BELONG TO ME. IT BELONGS TO THE WORLD."
Frederick Banting

Artificial Insulin

Human Insulin Production



- In 1982 ELI-LILLY was the first company to produce genetically engineered synthetic insulin,
- In 1978 Genentech team successfully introduced human insulin in bacteria. .
- in 1982 commercially available.
- Branded as human insulin or humulin .



Reference- image source- Google,Wikipedia ,book-Molecular Biology of The Cell 5th ed. Bruce Alberts

Name : Sanchari Sanyal
Semester : UG Sem 4
Department of Zoology
Bethune College ,Kolkata

This Year in 2021,
We are celebrating 100 years of this path changing discovery that making millions of diabetic life easier everyday...

Sanchari Sanyal
Bethune College

INSULIN INJECTION: A GREAT DISCOVERY

INSULIN INJECTION

DISCOVERERS OF INSULIN INJECTION

Frederick G Banting

Charles H Best

J.J.R Macleod

Before discovery of insulin injection people suffers from diabetes

DIABETES SYMPTOMS

High Blood Sugar

Increased Hunger

Excessive Thirst

Frequent Urination

Fatigue

Before discovery of insulin injection starvation is found

Name of the participant : Archikana Singha
Institution : Bijoy Krishna Girls' College
Department : Psychology
Semester : 6th

Archikana Singha
Bijoy Krishna Girls' College, Howrah

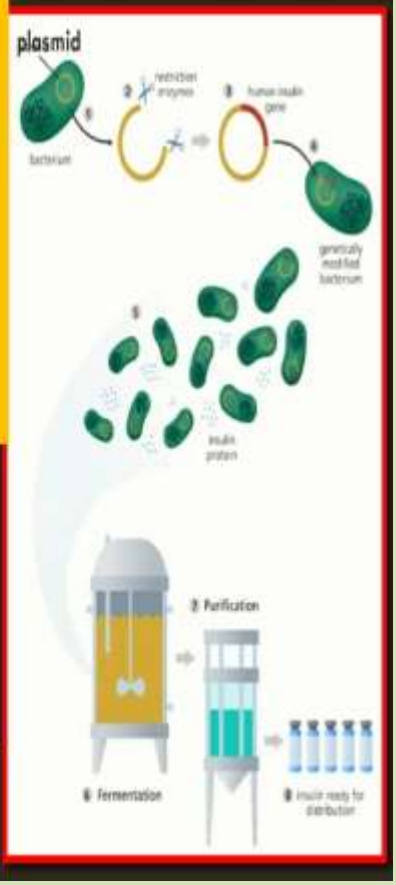
EVOLUTION OF INSULIN FROM PANCREAS TO PLASMID

ANIMAL INSULIN

Insulin from cattle and pigs was used for to treat diabetes since its discovery (1922) till the 1980s but it wasn't reliable as it caused allergic reactions in many patients.

RECOMBINANT INSULIN ERA AND ITS ADVANCEMENTS

In 1978, the first recombinant DNA insulin was prepared by David Goddel and his colleagues by combining the A and B chains expressed in Escherichia coli. Thereafter Genetech and Lilly commercialized rDNA insulin. The purity and quality of recombinant insulin was superior to animal insulin and was safer and more effective than the animal insulin.



Recent advancement in insulin delivery using insulin pumps

Chandani Desai
Goa University

DISCOVERY OF INSULIN A REVOLUTIONARY MILESTONE

$C_{257}H_{383}N_{65}O_{75}S_6$

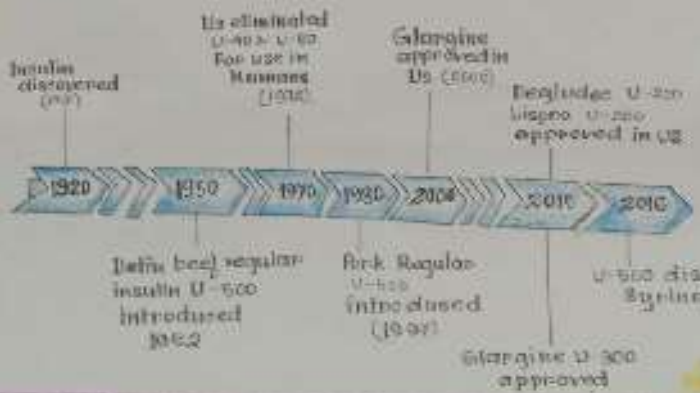
What is Insulin ?

Insulin is a peptide hormone produced by beta cells of the panereatic islets : It is considered to be the main anabolic hormone of the body. It regulates the metabolism of carbohydrates, fats and protein by promoting the absorption of glucose from the blood into liver, fat and skeletal muscle cells.

When the pancreas produces little or no insulin it causes type1 diabetes. When there is too much insulin in a persons body. It is most often the result of insulin resistance . Insulin resistance can eventually lead to type 2 diabetes.

Sir Frederic G Banting

Milestones in Insulin Development

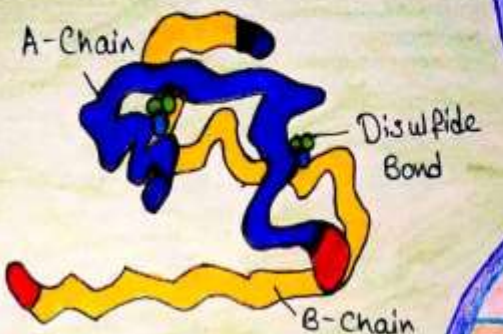


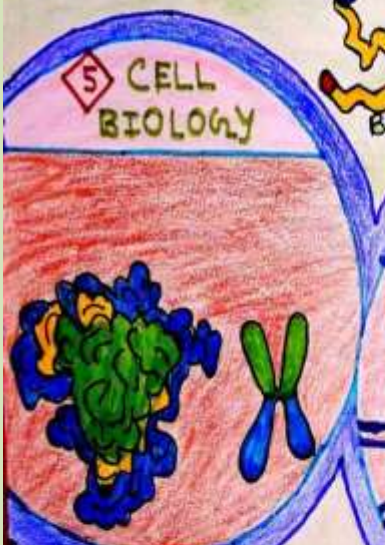
Sauvik Roy
Netaji Nagar Day College

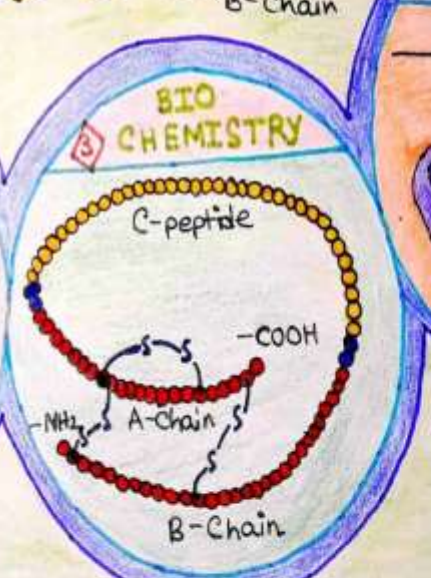
"INSULIN: A UNIFYING THEME IN LIFE SCIENCE"

NAME: PRIYANKA SENGUPTA
INSTITUTION: NEW ALIPORE COLLEGE
SEMESTER: 2ND
DEPARTMENT: ZOOLOGY (A)

Insulin was discovered by Sir Fredrick G Banting, Charles H Best and JJR Macleod at the University of Toronto in 1921 and it was subsequently purified by James B Collip.







1 NUTRITION:

Eating certain foods can help you lose weight and overcome insulin resistance like high-fiber foods, including beans and lentils, some whole grains, including oats, quinoa, lean meats, fish.

2 DIABETES AND BIOTECHNOLOGY:

Millions of diabetics world wide use synthetic insulin to regulate their blood sugar levels. this human insulin was the first foriden molecule of the biotech industry.

3 BIOCHEMISTRY:

Insulin serves to increase PPI substrate specific activity on glycogen particles. it turn st. mutating the synthesis of glycogen.

4 RECOMBINANT INSULIN:

It replaced the animal insulins and semi-synthetic insulin obtained by modification of animal insulins.

5 CELL BIOLOGY: Insulin allows cells to take up this glucose and use it as a source of energy so they can function properly.

Priyanka Sengupta
New Alipore College


Thank You!