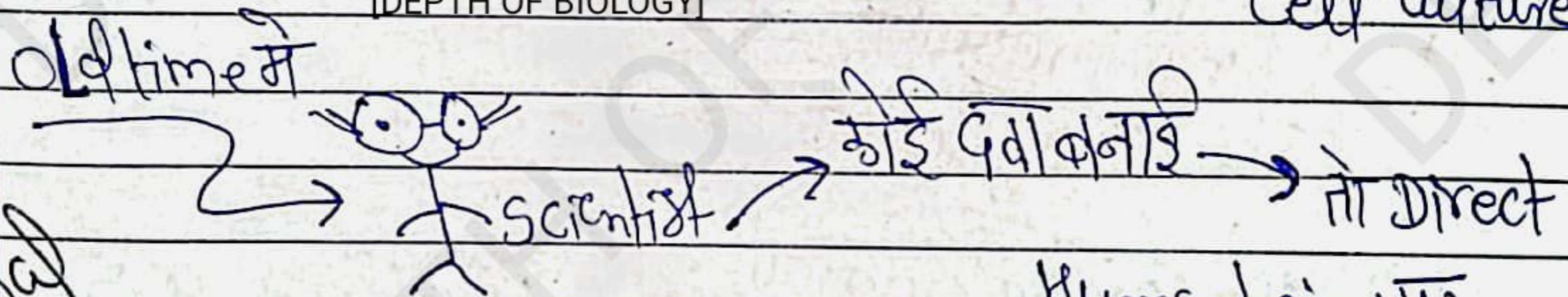


Animal Cell Culture →

Growth of Animal Cell in Culture, general procedure for Cell culture, Primary, established & transformed Cell culture

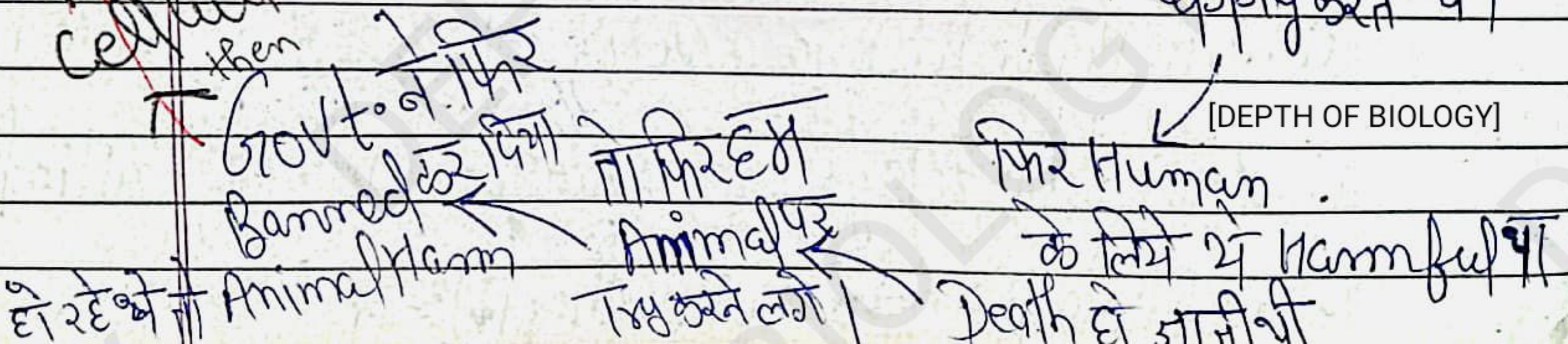
[DEPTH OF BIOLOGY]



Human beings पर apply करेंगे थे।

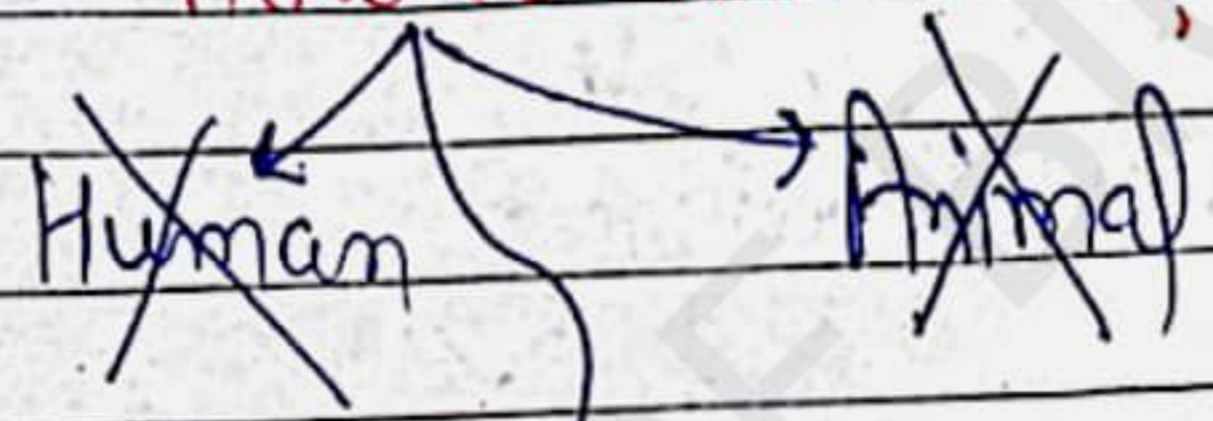
[DEPTH OF BIOLOGY]

~~Animal Cell Culture~~

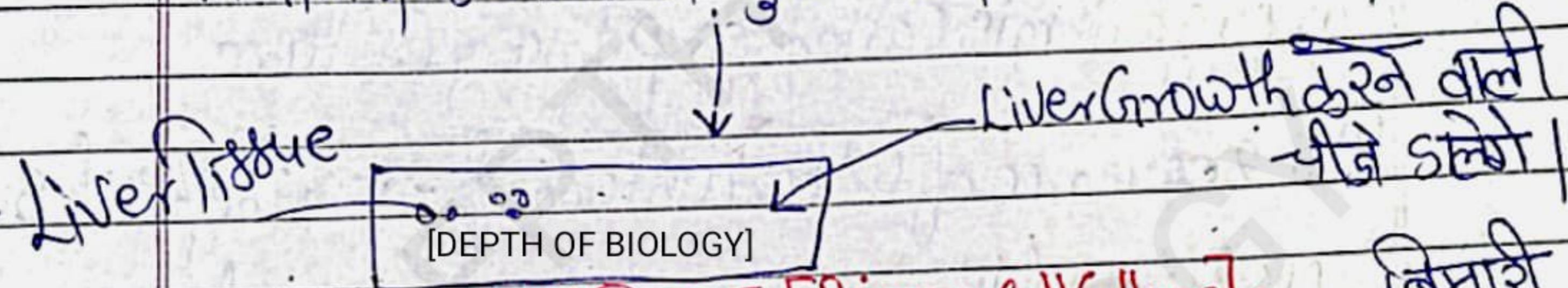


eg ⇒ जैसे हमने Liver की क्या बनाई

How we check क्या ?

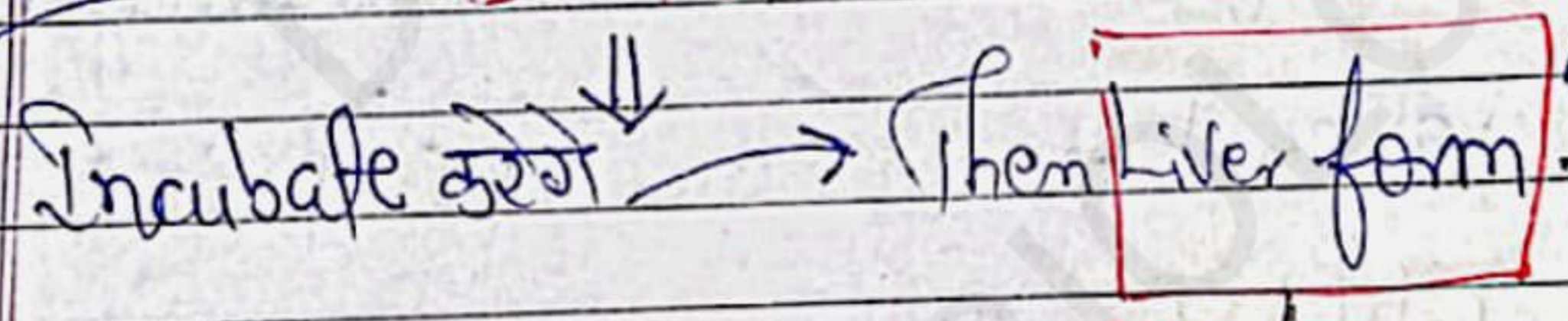


Animal के Liver से कुछ Cell लेते हैं हम



CULTURE [Primary Cell Culture]

बिमारी



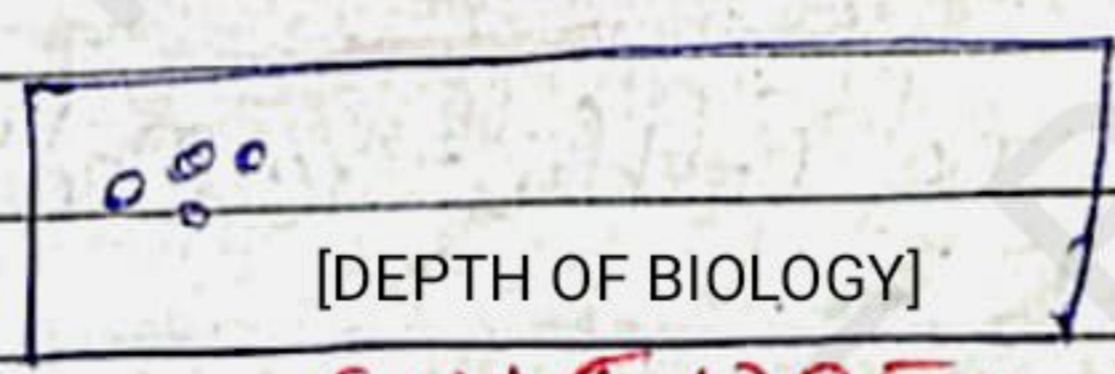
GdI medicine

— Then we found that our medicine work proper or not?

or our medicine give side effects

Old culture से Liver cell लिने (Cell Line)

Sub culture Processing



CULTURE [Secondary Cell Culture]



⇒ Application of cell culture in pharmaceutical Industry & research,

⇒ The animal cell culture is a technique in which cells are obtained from animals, grown & maintained in a suitable medium.

The culture procedure by cell or tissue taken from an organism is called as primary culture.

The sequence of culture obtained from the first sub-cultivation of the primary culture is called Cell Line.

— The 1st attempt to grow animal cell in culture is attributed to Ross Harrison in 1907. He was able to culture frog embryonic nerve cell using the Hanging drop technique.

Growth of Animal Cell in Culture ⇒

— Design of animal cell culture media is more difficult than that of microorg. & Plant Culture.

— Culture media are used to support the survival as well as growth.

Selection of media is dependent on type of cell & main objective of culture.

⇒ Culture Media Classified as ⇒

Natural ← → Artificial / Synthesized.

[DEPTH OF BIOLOGY]

1. NATURAL ⇒ This media are obtained from Natural sources. Such as plasma, clot or Coagulants, Biological Fluid & tissue extracts.
⇒ It is mixture of Plasma protein, Peptides, Lipids, Carbohydrate, Hormones enzymes & minerals.

2. Artificial Media ⇒

[DEPTH OF BIOLOGY]

It is prepared by adding Organic & Inorganic Nutrients. Vitamin, Salts, Serum protein, Carbohydrates, O₂ & CO₂ gases.

• Serum Containing Media ⇒ In which serum is added in 5-20% amount.

• Serum free Media → These are developed to overcome the limitation of serum. It has ability to make the medium more selective for a particular cell types.

Procedure for Cell Culture ⇒

[DEPTH OF BIOLOGY]

A piece of tissue from the organism is usually quite complex & it contain connective tissue cell variety of blood cell & reticuloendothelial cell.

The first Cell suspension is Isolated & then inoculated into a new culture Vessel along with fresh medium (Primary Cell Culture). [DEPTH OF BIOLOGY]

Stage for Cell Culture ⇒

- ① Isolation of tissue
- ② Disaggregation
- ③ Seeding the Culture into Culture Vessel.

① Isolation of the tissue ⇒ [DEPTH OF BIOLOGY]

The ex-plant from an excised (cut surgically) portion of the body of the animal is used for the culture of animal Cell in a suitable Nutrient medium.

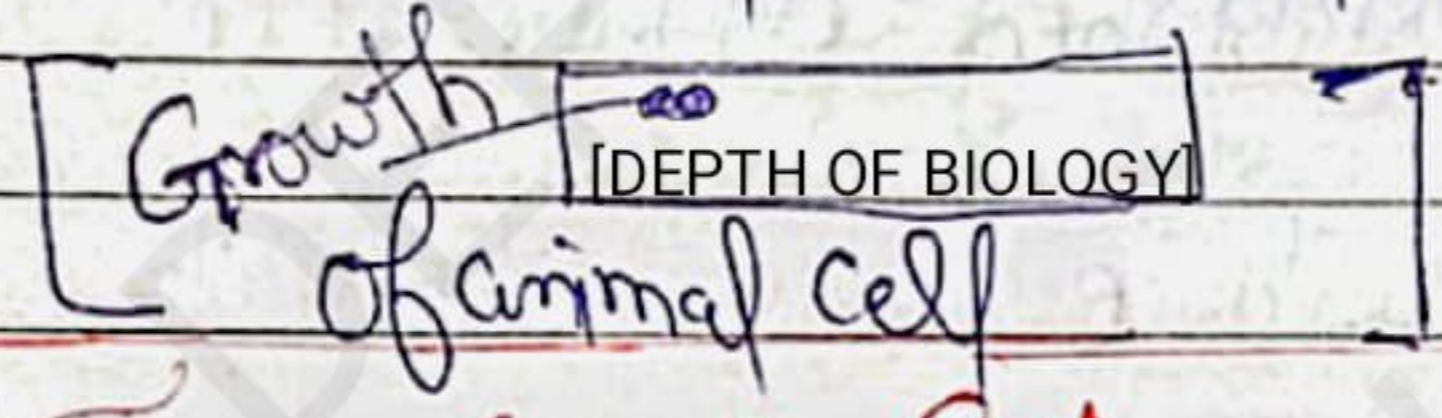
- Animal are Mice, Rabbit, Guinea, Pig etc.
- Organ from which Cell are to be Isolated are surface Sterilised with 70% Alcohol. & then removed aseptically.
- The tissue Isolate from ex-plant is either stored in freeze or used Immediately.

विच्छेदन
↑

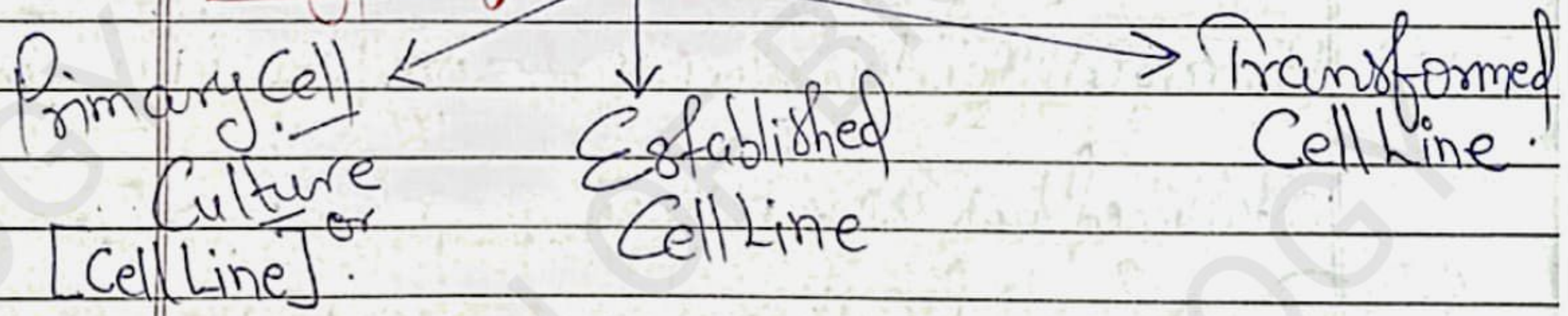
[DEPTH OF BIOLOGY]

② Disaggregation of tissue ⇒
A primary cell culture is obtained by disaggregating the tissue mechanically, enzymatically or by use of chelating agent [EDTA].

③ Seeding the culture ⇒
into culture vessel → The dissociated (primary) cell grow well when seeded on culture plates at high density.



Types of Cell Culture ⇒



① Primary Cell Culture ⇒ When the cells are surgically removed from an organ & place into suitable culture environment they will attach, divide & grow.

- It is 1st step to establish a cell culture.
- This is called Primary Cell Culture.

2

Established Cell Line \Rightarrow

or Cell Culture

When the primary Cell Lines continue to grow & divide they are sub-cultured in fresh Media to maintain their viability & growth. [DEPTH OF BIOLOGY]

After Many subculturing (about 70 times) these cells are called established Cell Lines (Cell Culture).

\Rightarrow Primary Cell Culture can grow very slowly, But established Cell Line grow faster. [DEPTH OF BIOLOGY]

\Rightarrow Primary Cell maintains the properties of Parent Cell, but established has some altered properties.

3

Transformed Cell Culture \Rightarrow

Dr. Transfer do
1941 ई. 1941 ई.

70 time growth

In which established Cell Line Cells become Immortal (i.e. Cells have the capacity to grow indefinitely).

تعداد

کلی

This capacity is generated due to transformation in genetic Material, due to this transformation, Cells lose the [DEPTH OF BIOLOGY]

گرومن

sensitivity to External stimuli & also sometime show changes in Chromosomal Number.

Organs

Culturing of single cell in suitable culture media

[Primary Cell Culture]

frequent sub-culturing (around 70-80 times).

[Established Cell Culture].

After more than 80 sub-culturing, grow indefinitely.
(Transformed Cell Culture).

Application of Cell Culture in Pharmaceutical Industry & Research ⇒

These are various application of cell culture ⇒

① Model system ⇒ It is used as a model system in research that helps to study in basic cell biology, effect of substance on cell etc.

[DEPTH OF BIOLOGY]

② Production of vaccines ⇒ Cells are used to produce vaccines.

eg ⇒ for hepatitis, Rabies, chicken pox vaccines.

(4) → This also helps to develop any technique, method or any drug for cancer treatment.

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(3) Toxicity Study ⇒ Culture Cells are widely use alone or with animals to study the therapeutic toxic effect of drug, cosmetics & other chemicals.
— Also help in development of dose fixation, study of any therapeutic agent.

[DEPTH OF BIOLOGY]

(4) Cancer Research ⇒ Cultured animal cell are transformed into cancer cell & examined for therapeutic effects of any drug or chemical agent or any other method.

(5) Virology ⇒ Cultivation & study of virus is called virology. Virus are cultured for vaccine production genetic engineering & to study their infection pathology.

(6) Genetic Engineering ⇒ Cell culture in Artificial Media are used for genetic engineering or manipulation in Genetic Material (DNA & RNA).

[DEPTH OF BIOLOGY]

[DEPTH OF BIOLOGY]