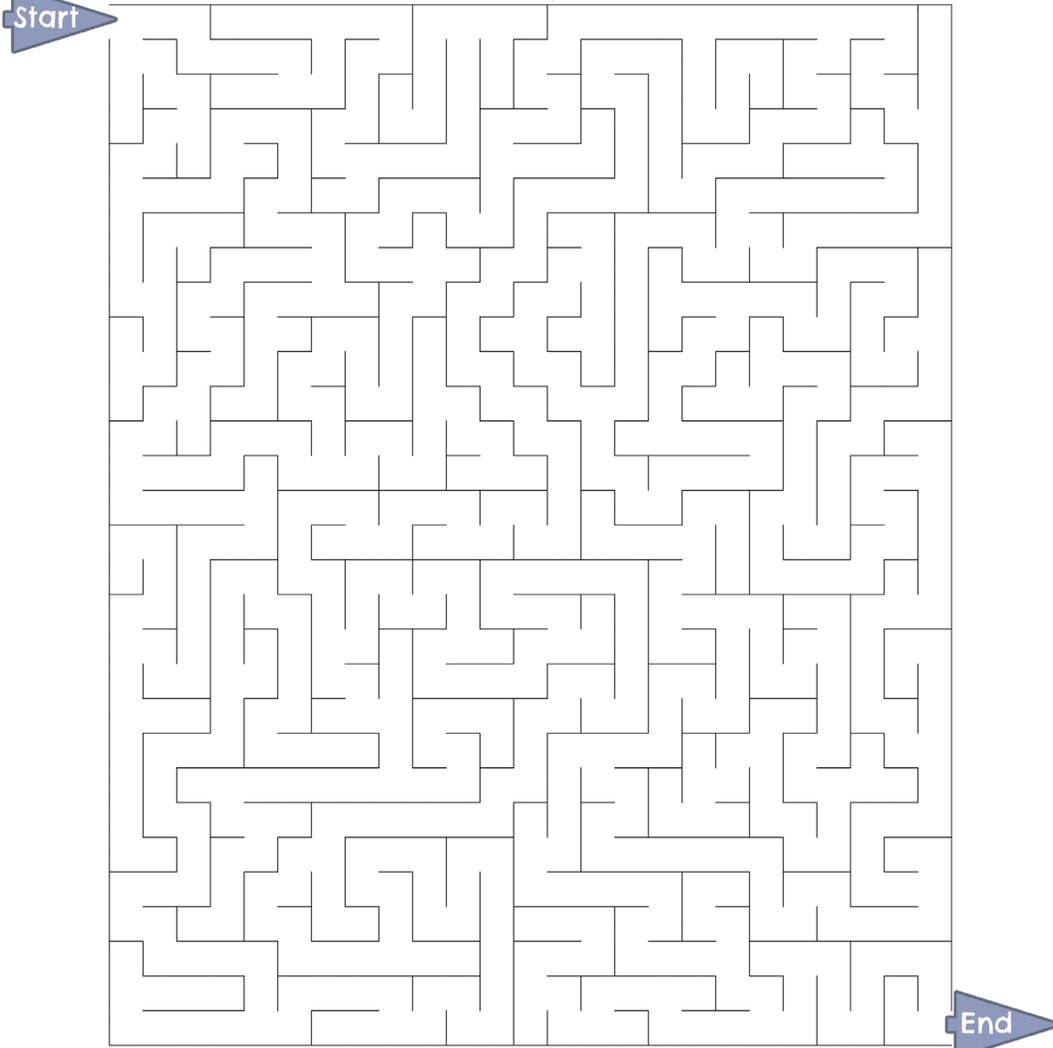


**NEGLECTED DISEASE  
DRUG DISCOVERY  
ACTIVITY BOOK**

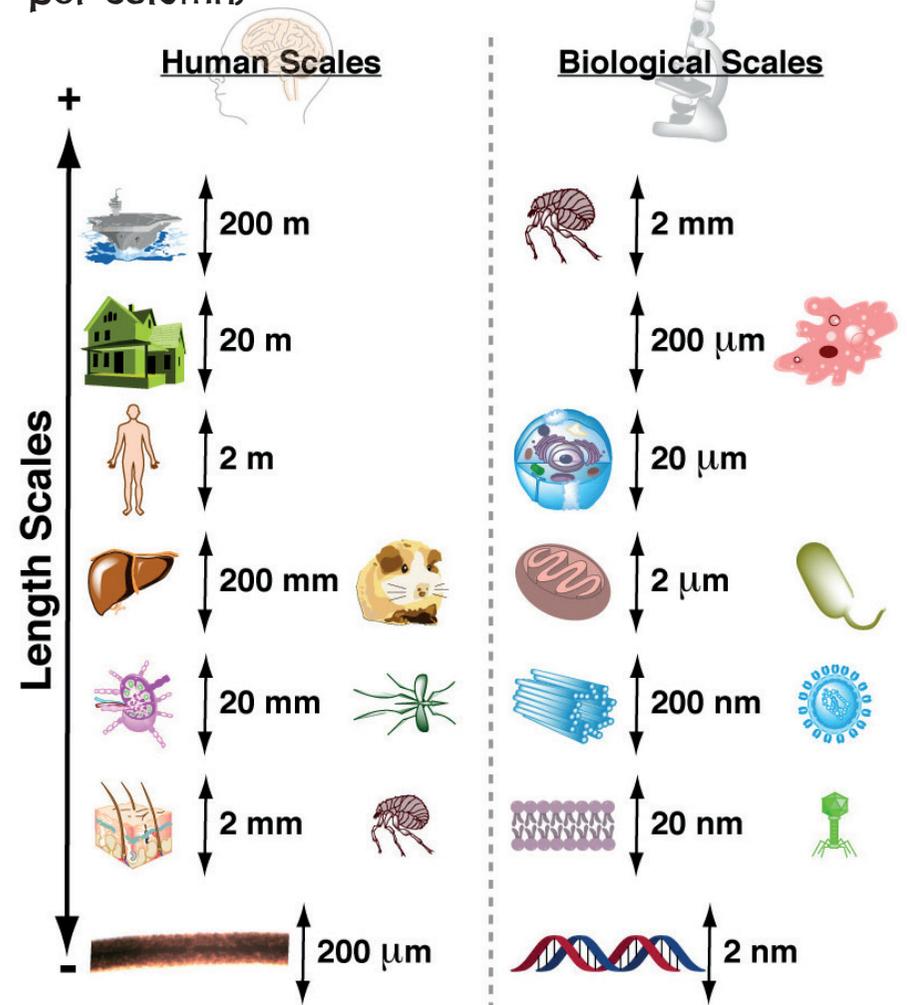
© S.DUCE & D.MACGOWAN  
I.H.GILBERT

# RESEARCH MAZE



## Biological and Human Scales

Molecular and cellular biology scales compared to human scales (approx 5 orders of magnitude per column)



**Human Scale Key:** Aircraft Carrier (200m), 3-story House (20m), Human (2m), Liver/Gerbil (200mm), Lymph Node/Mosquito (20mm), Skin/Flea (2mm), Hair thickness (200um)

**Biological Scale Key:** Flea (2mm), Amoeba (200um), Eukaryotic Cell (20um), Mitochondria/Bacteria (2um), Centriol/Large Virus (200nm), Cell Membrane/Small Virus (20nm), dsDNA thickness (2nm)

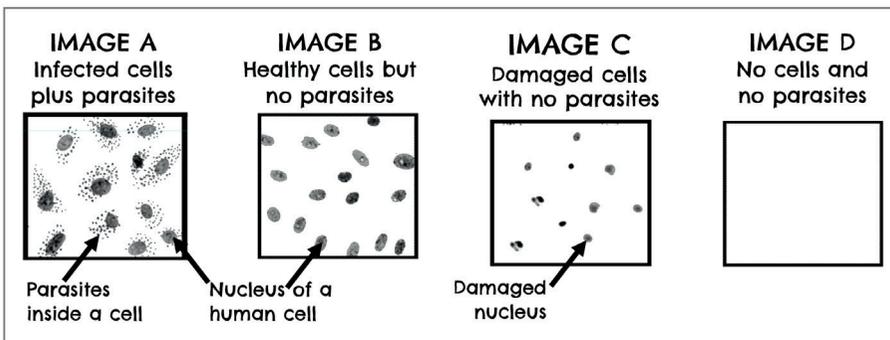
by Eugene Douglass & Chad Miller - <https://www.practicallyscience.com/intuiting-biological-scales-using-human-scales/#more-53>

# IMAGES OF A 96-WELL SCREENING PLATE

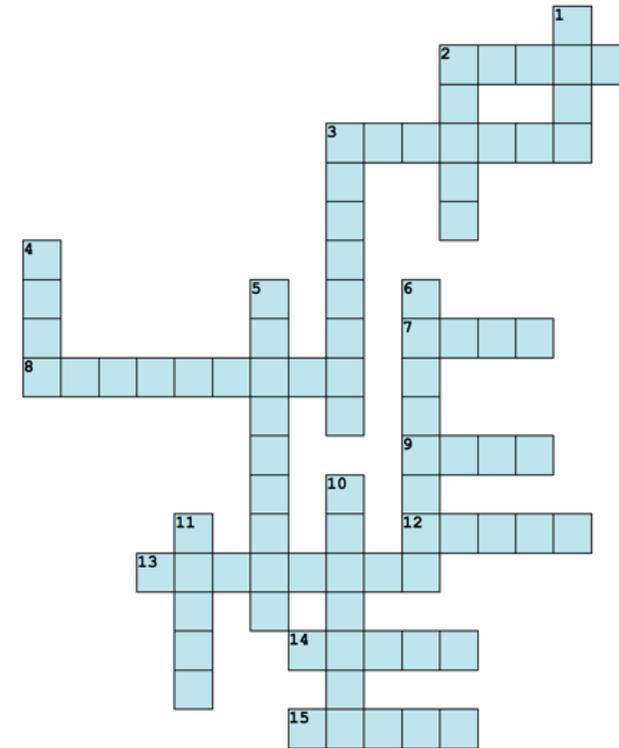
Colour all the wells that contain healthy cells with no parasite infection, IMAGE B in the KEY below.

	1	2	3	4	5	6	7	8	9	10	11	12
a												
b												
c												
d												
e												
f												
g												
h												

## KEY:



# DRUG DISCOVERY CROSSWORD



## Across

- The final outcome if a treatment for a disease is successful (5)
- A unit of energy that is used to measure energy content of food. It is equal to 4.184 joules (7)
- The basic units of matter and the essential structure of elements (4)
- The movement of molecules from an area of high concentration to one of low concentration (9)
- Product of a reaction between an acid and a base (4)
- Description of a substance that is poisonous or harmful; the warning signs is often a skull and crossbones on a yellow triangle (5)
- An organelle within a cell that produces proteins from amino acids (8)
- The vessels through which blood flows towards the heart (5)
- This describes a compound that is unreactive (5)

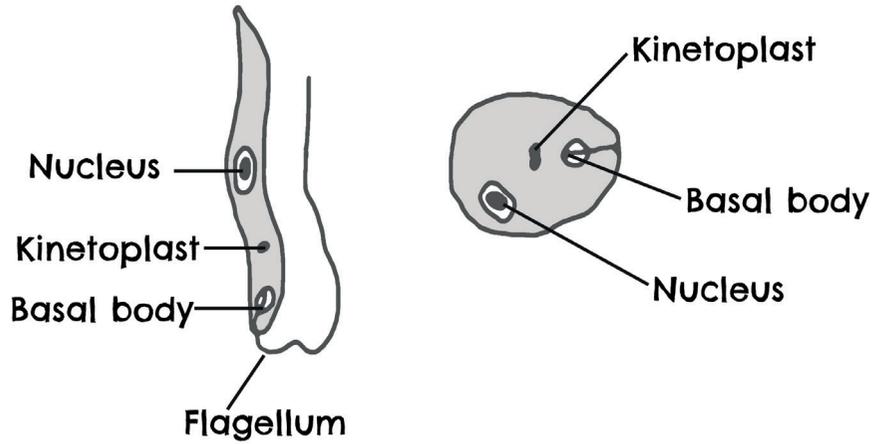
## Down

- The functional segments in the chromosomes that code for proteins (4)
- Organisms that are genetically identical to their parent, Dolly the sheep is one (5)
- The substance that is formed in a reaction between two or more chemical elements (8)
- The name of the chemical link formed between atoms in molecules, they hold molecules and materials together (4)
- A reaction in which oxygen is added to a molecule or electrons are lost by a molecule (9)
- A tiny creature that lives in or on another living organism and survives by obtaining its food from that organism (8)
- A molecule that is made up of long chain of amino acids (7)
- A tiny disease-causing organism that replicates inside living cells and are very common causes of illness (5)

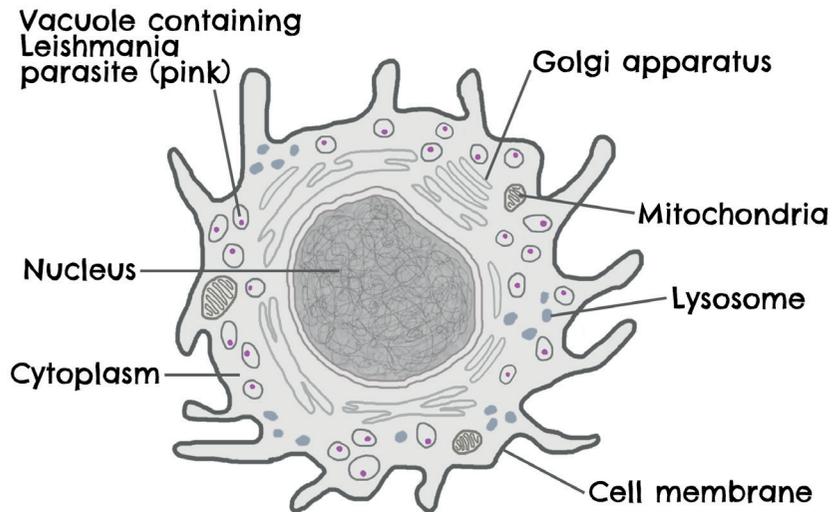
# LEISHMANIA PARASITES

in insects

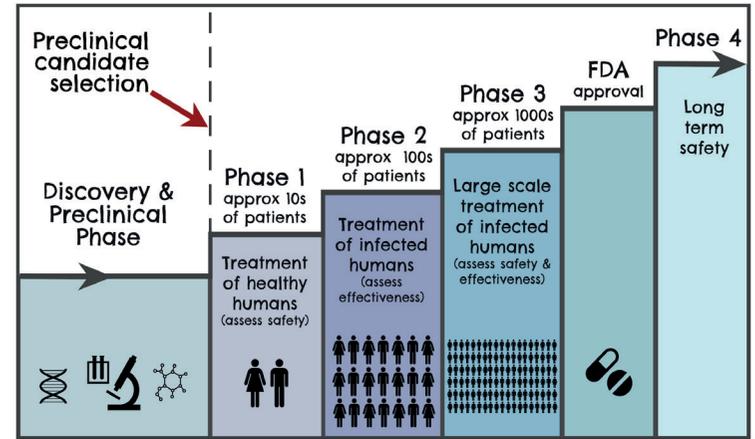
in humans



# PARASITES INSIDE MACHROPHAGE CELL

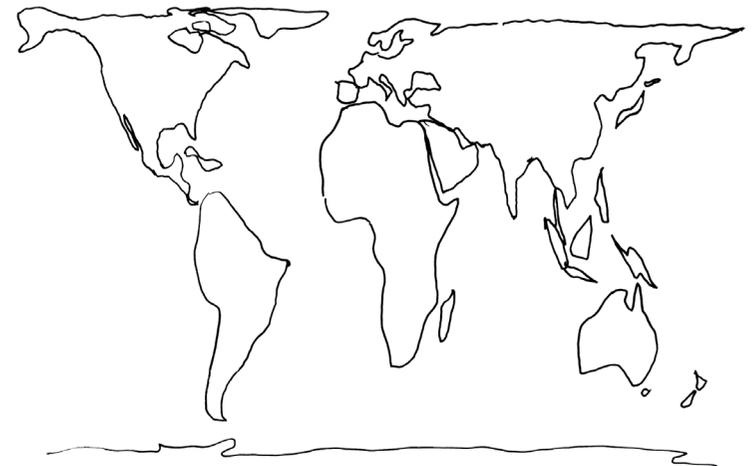


# THE DRUG DISCOVERY PATHWAY



This pathway typical takes 10-20 years

# WHERE DOES LEISHMANIASIS OCCUR?



CHECK World Health Organisation's website at:  
[https://www.who.int/leishmaniasis/leishmaniasis\\_maps/en/](https://www.who.int/leishmaniasis/leishmaniasis_maps/en/)