

## LABORATORY BUILDING AT BLINDERN

A collection of research



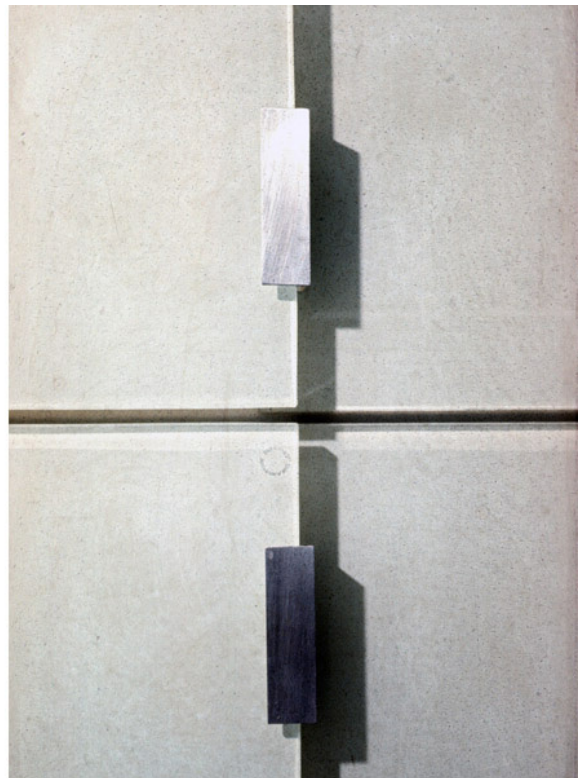
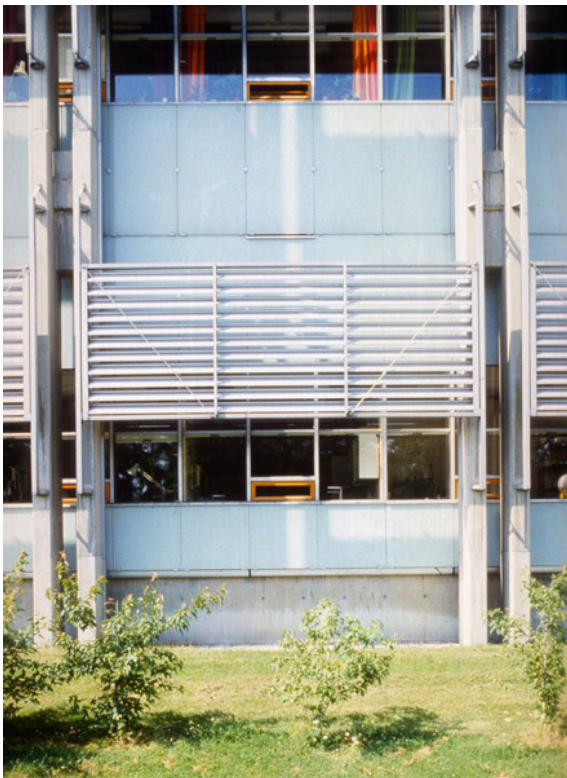
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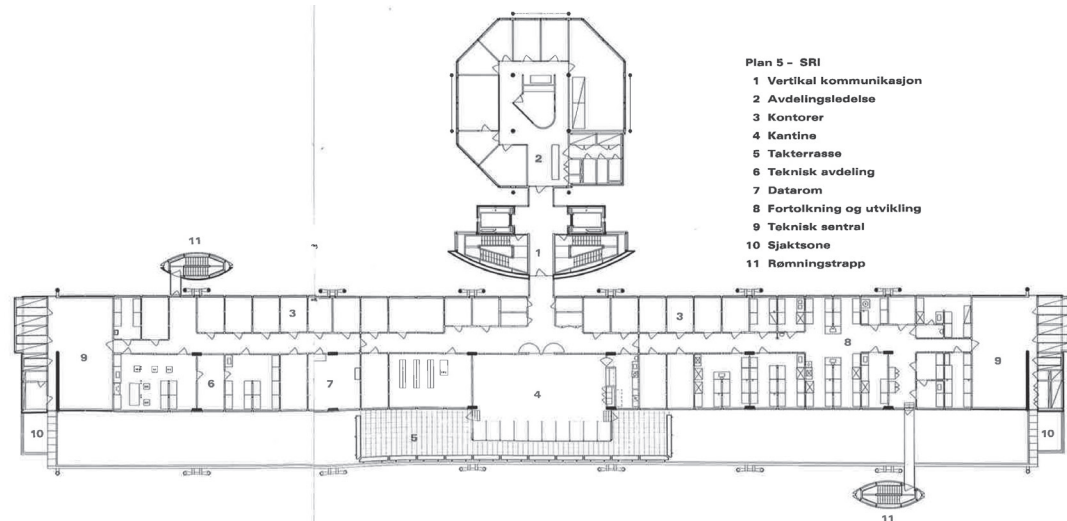
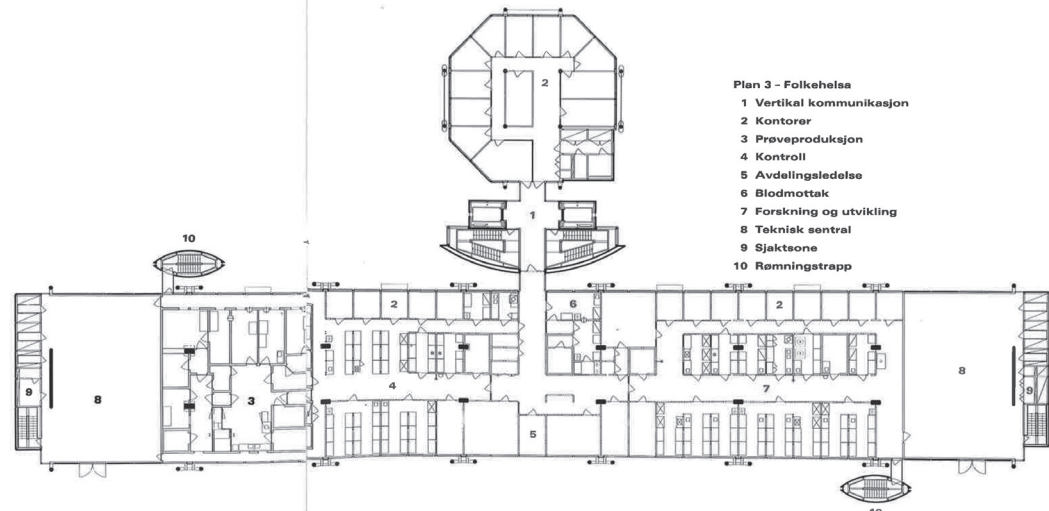
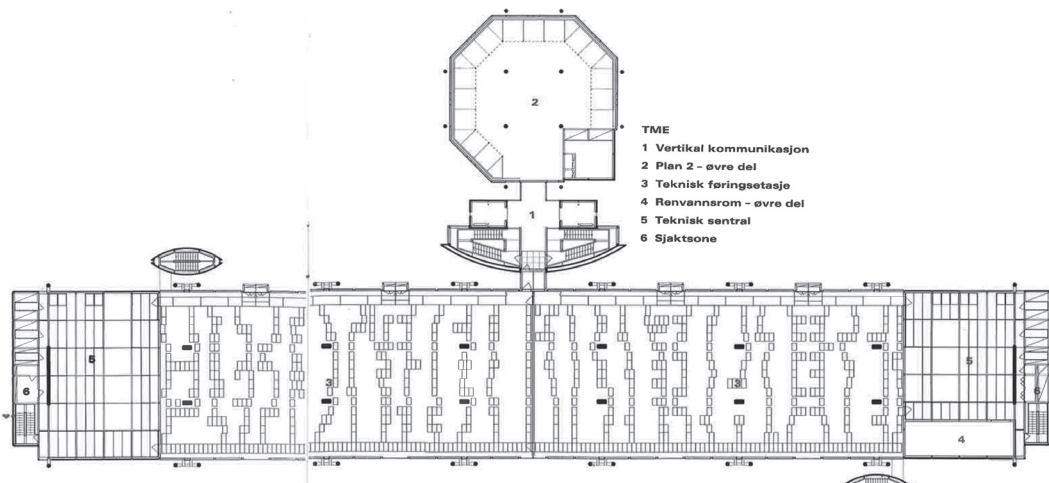
Louis Kahn, Salk Institute og Biological Studies

I. References



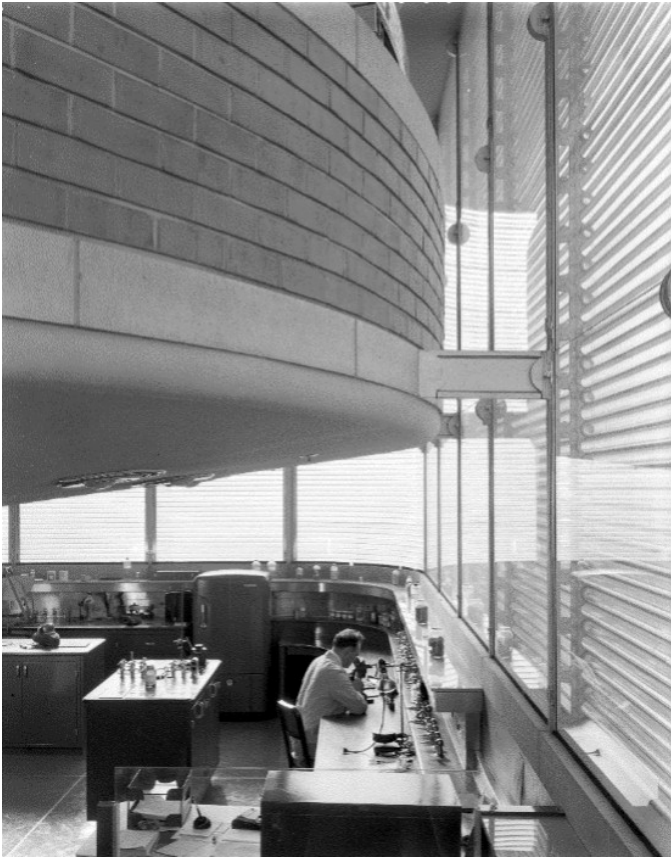
Laboratory Ullevaal, Oslo  
ØKAW Arkitekter

# I. References



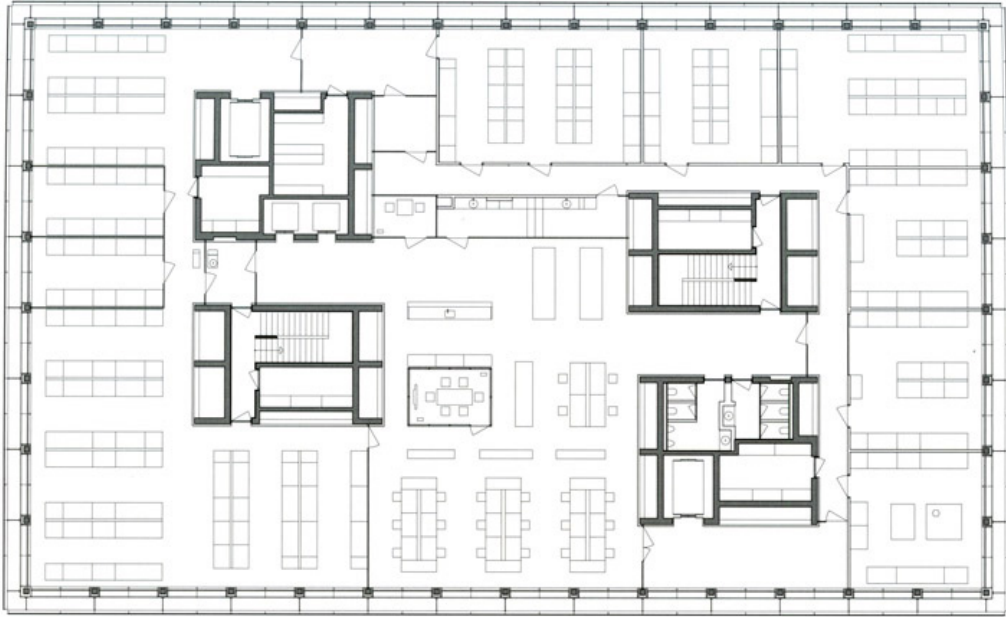
Folkehelseinstituttet  
ØKAW arkitekter

## I. References



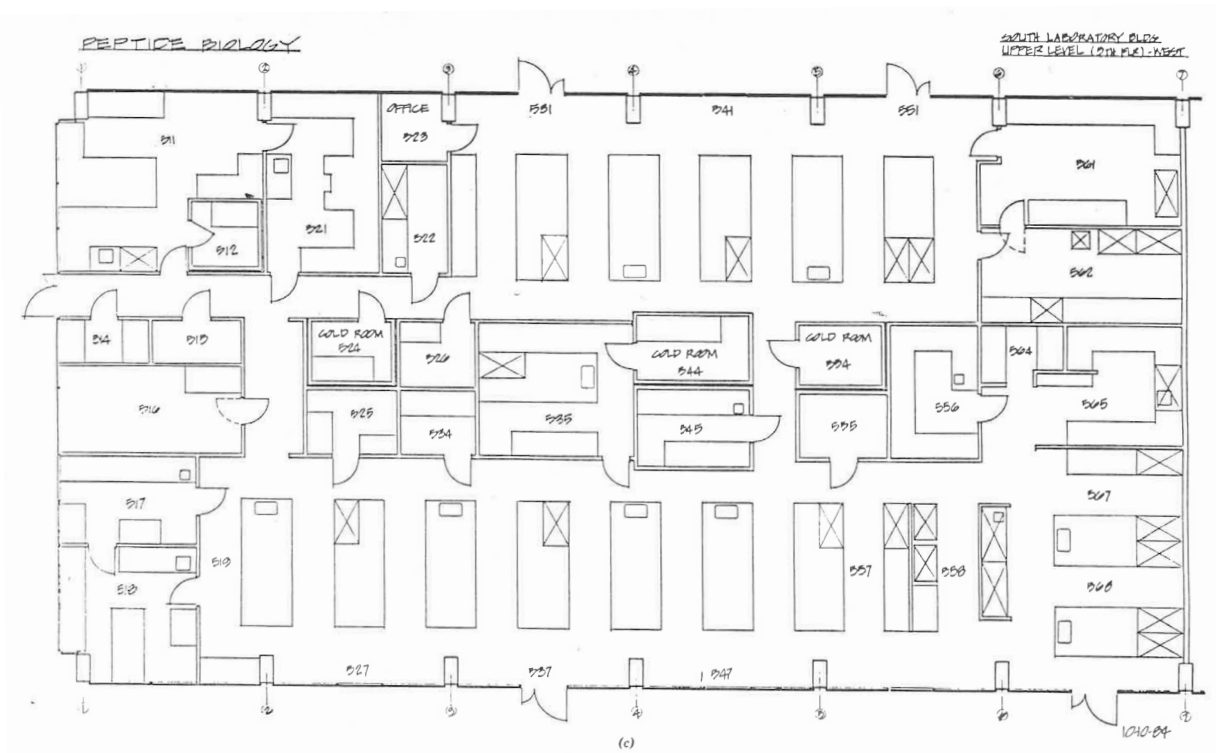
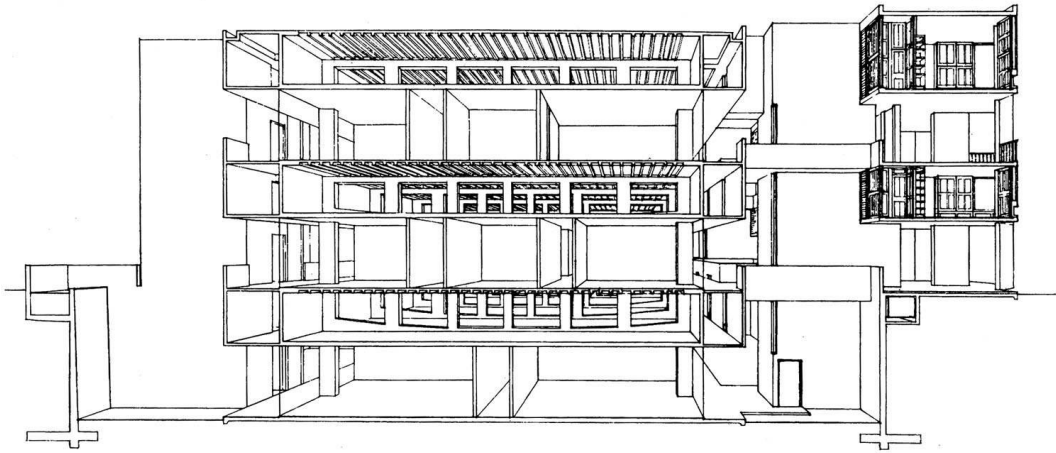
Top: Frank Lloyd Wright, Johnson Wax  
Bottom: Louis Kahn, Salk Institute

## I. References



Alvaro Siza, Novartis Campus, Basel

I. References



Louis Kahn, Salk Insitute  
Top: Section, showing interstitial floor  
Bottom: Plan of the South Laboratory Building, upper level - west.

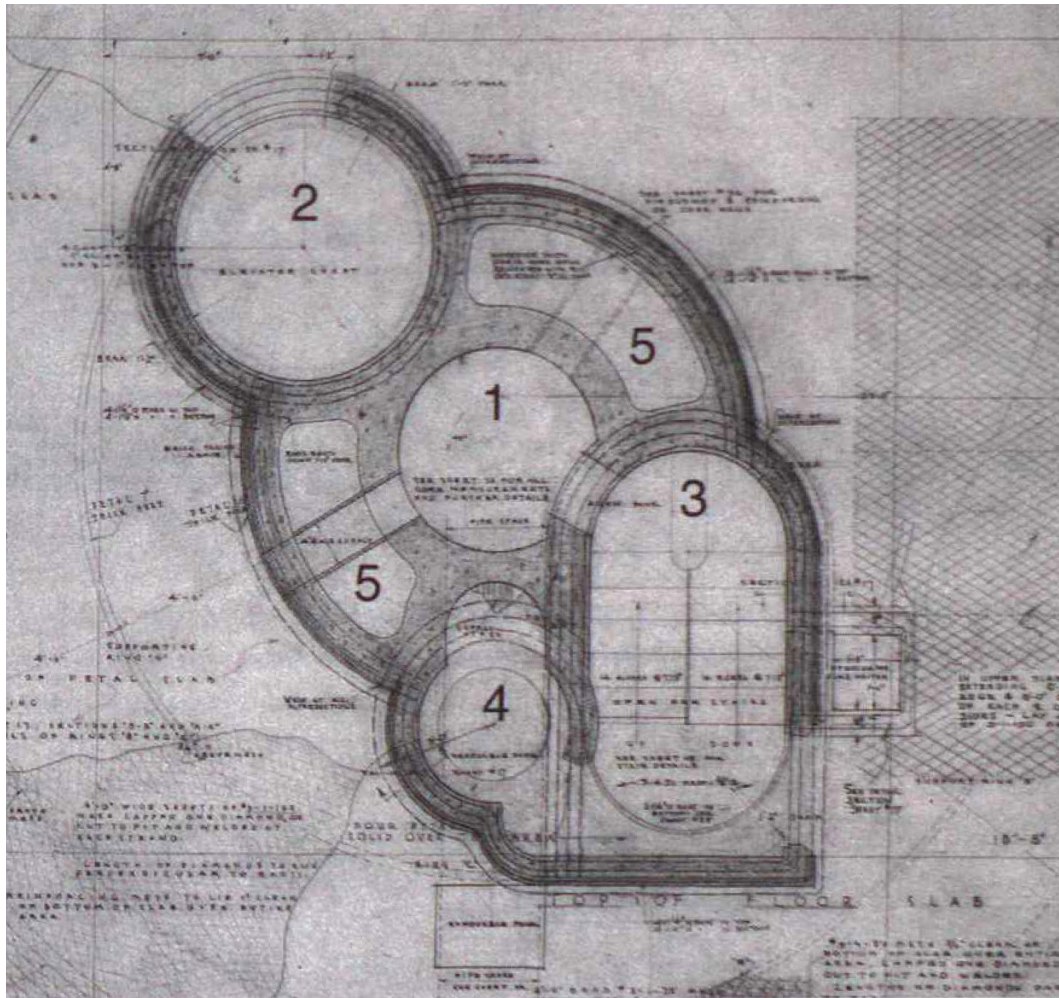


## 2. Typical Labs



Marie Curie (1867-1934) in her Laboratory in the Sorbonne, Paris 1911. She was a physicist and chemist who conducted pioneering research on radioactivity.

## 2. Typical Labs



Johnson Wax Research Tower plan diagram, Frank Lloyd Wright

1. Supply
2. Elevator
3. Stairs
4. Toilet
5. Exhaust

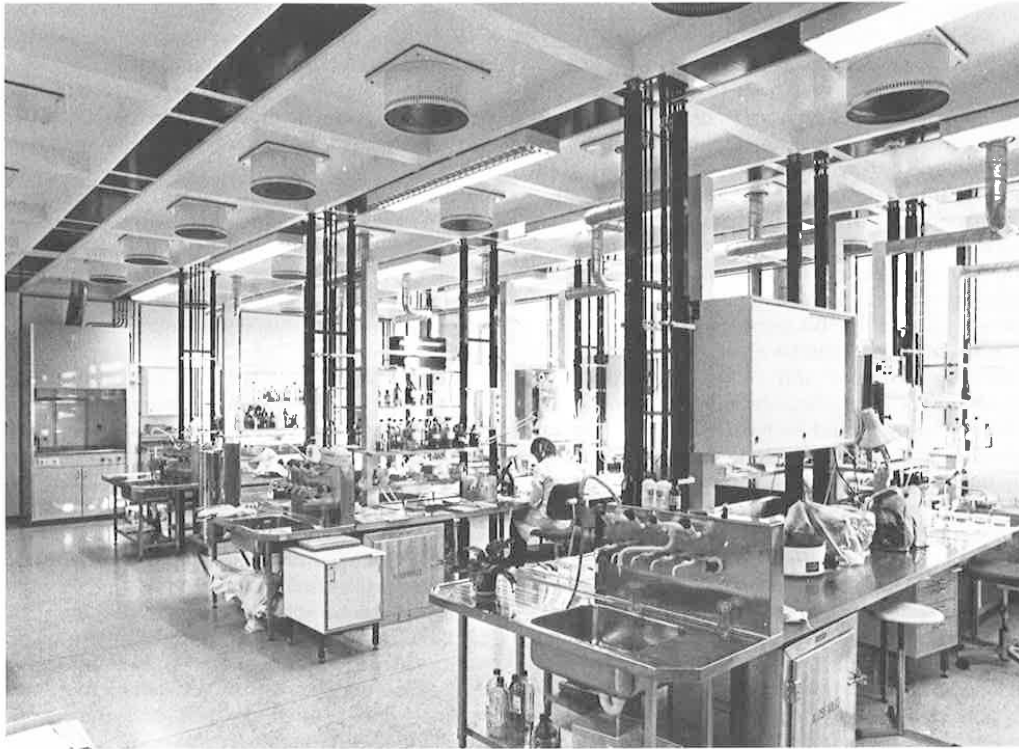


Figure 1.6 Typical lab at Ulløval Hospital.

field Foundation,\* and time has shown that the planning dimensions developed as part of this study still have validity.

Laboratory tasks typically involve two elements, equipment and somebody to operate it. Sometimes two tasks occur with the operators back to back (see Fig. 1.7). Work tops are conveniently about 600 mm (23.622 inches) deep with 150 mm (5.905 inches)† behind them for wall-mounted services; an operator occupies a similar space. When these dimensions are added together, and circulation space is added as well, a working dimension

is derived which is a measure of most laboratory tasks.

An interval about 3.5 meters between the center line of laboratory partitions—and 3.6 meter (11.811 ft.) is a convenient, duodecimal number—will allow space in which two people may work back to back at equipment and a third person may pass between them. This is an ergonomic measure, and it is as true for the different sorts of equipment which nowadays make up the armamentary of the laboratory worker as it has always been (see Fig. 1.8). The fact that wall and floor space, once used for benches, is now often used for electronic equipment makes no difference. A planning module of 3.6 meters (11.811 ft) × 7.2 meters (23.622 ft) is available within the same plan discipline, and a room may be increased further in 3.6-meter steps.

\*Nuffield Foundation Division for Architectural Studies, *The Design of Research Laboratories*, Oxford University Press, London, 1961.

†Metric to customary conversions given are not rounded.

## 2. Typical Labs



Top: Frick Chemistry, Princeton University  
Bottom: Hopkins Building

## 2. Typical labs



Clean room

## 2. Typical labs



Harry Perkins Institute of Medical Research, Australia

## 2. Typical labs



Renzo Piano + Payette, Harvard Art Museums Renovation and Expansion

## 2. Typical labs



Hopkins + Payette, Frick Chemistry Laboratory, Princeton





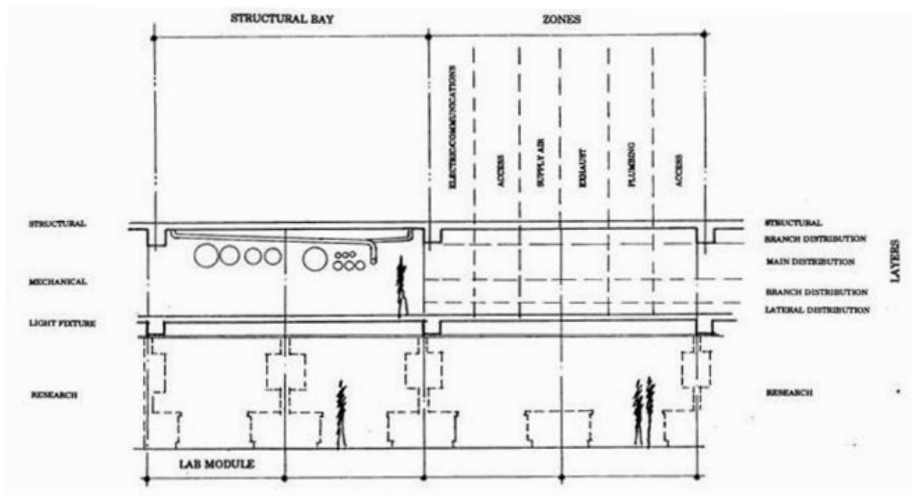
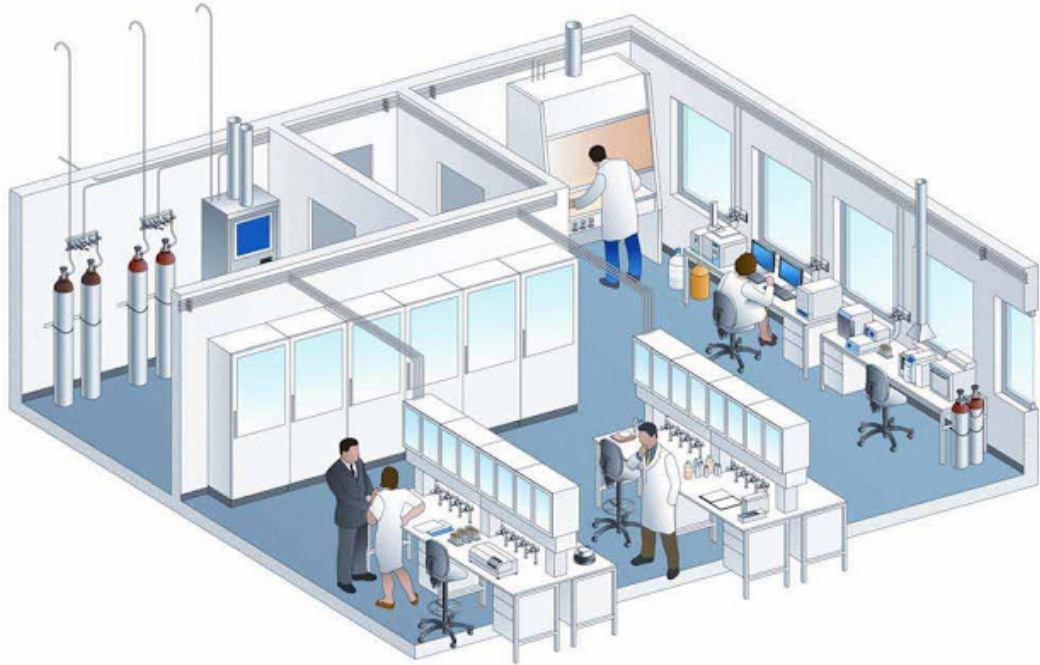
BSL-4 laboratory, chemical shower, to use when exiting.

### 3. Equipment / Systems

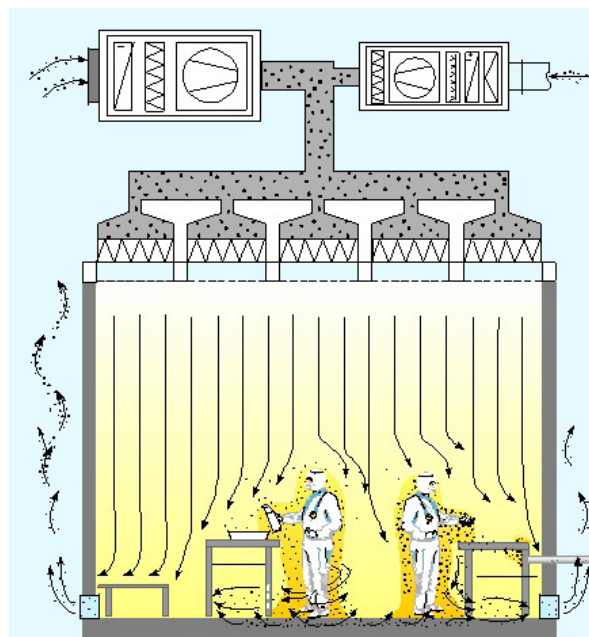
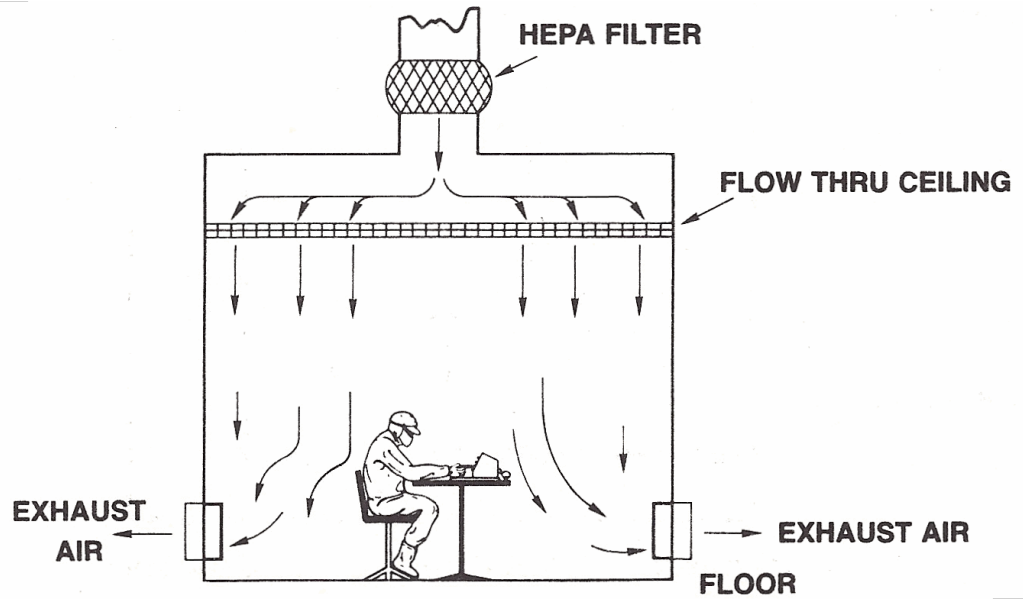


Top: Exiting a BSL-4 laboratory (Texas, US)  
Bottom: Typical BSL-3 laboratory

### 3. Equipment / Systems

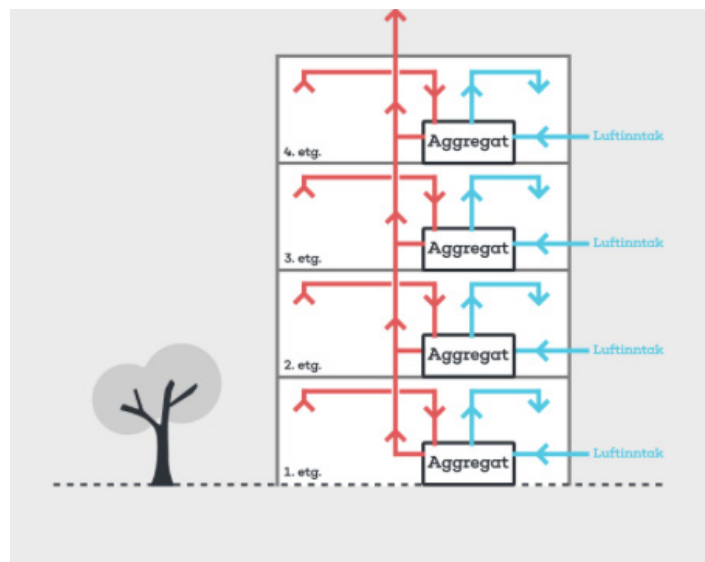
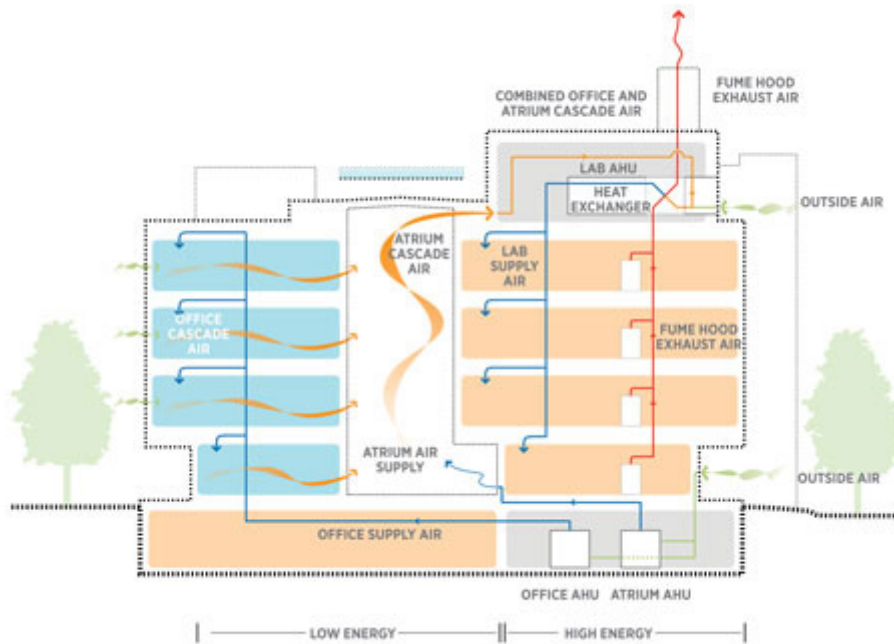


Top: Laboratory gas piping systems  
Bottom: Schematic lab structure with interstitial floor



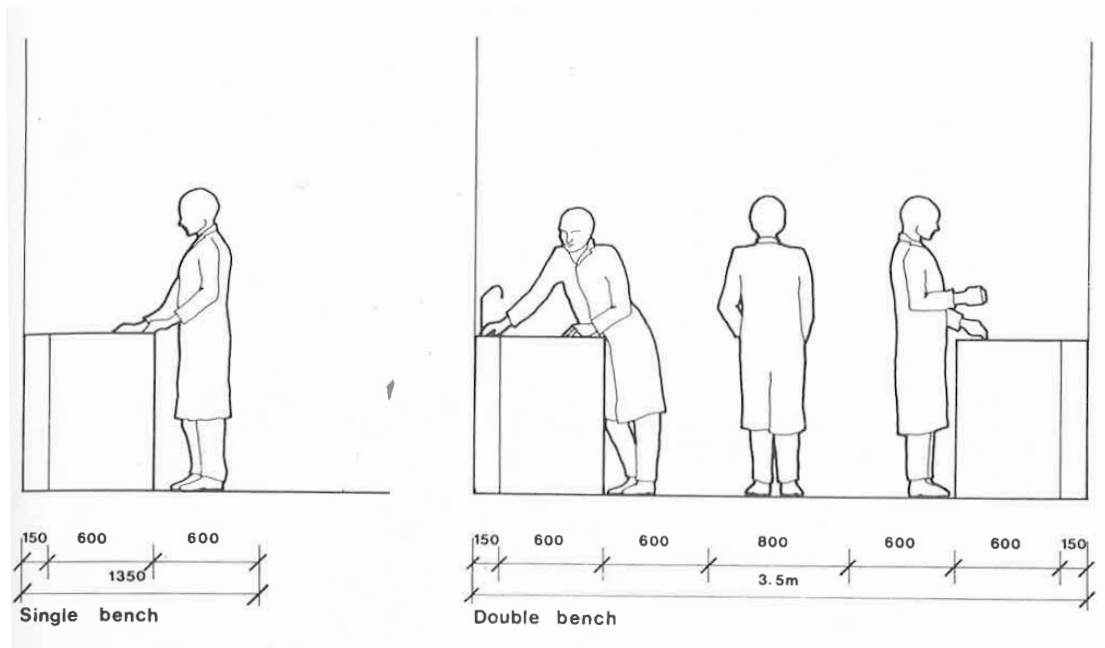
Air supply and air flow.

### 3. Equipment / Systems



Top: Air supply diagram at Princeton University Chemistry building  
Bottom: Decentralized ventilation systems

### 3. Equipment / Systems



Top: Ergonomic dimensions for laboratory work.



Electron microscope

### 3. Equipment / Systems



Biosafety cabinets.





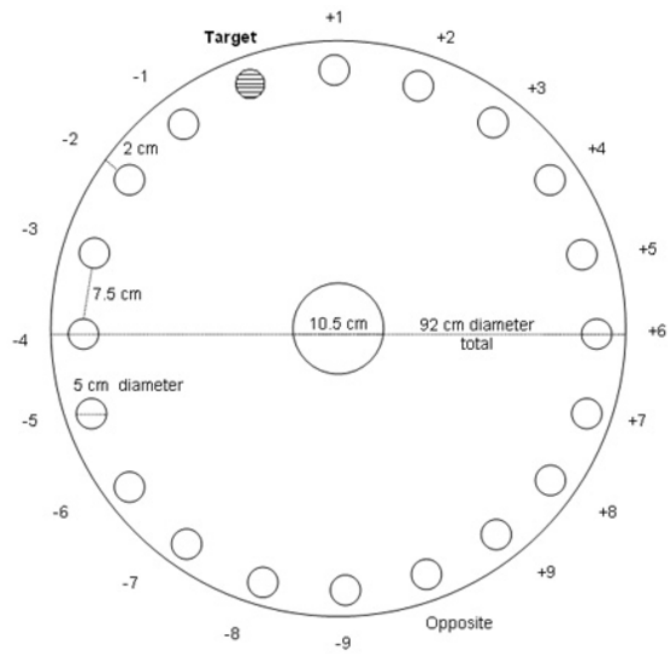
Positive pressure personnel suits (PPPS), used when working in BSL-4 laboratories.

### 3. Equipment / Systems



Mouse storing systems, University of Bergen

### 3. Equipment / Systems



Top: IVC mouse rack (individually ventilated cages for mice)  
Bottom: Barnes maze, used to measure spatial learning and memory in animals.

### 3. Equipment / Systems



Top: confocal microscopy  
Bottom: sentrifuges

#### 4. Common Model Organisms



*Arabidopsis thaliana*, Thale cress, the most common model plant.

#### 4. Common Model Organisms

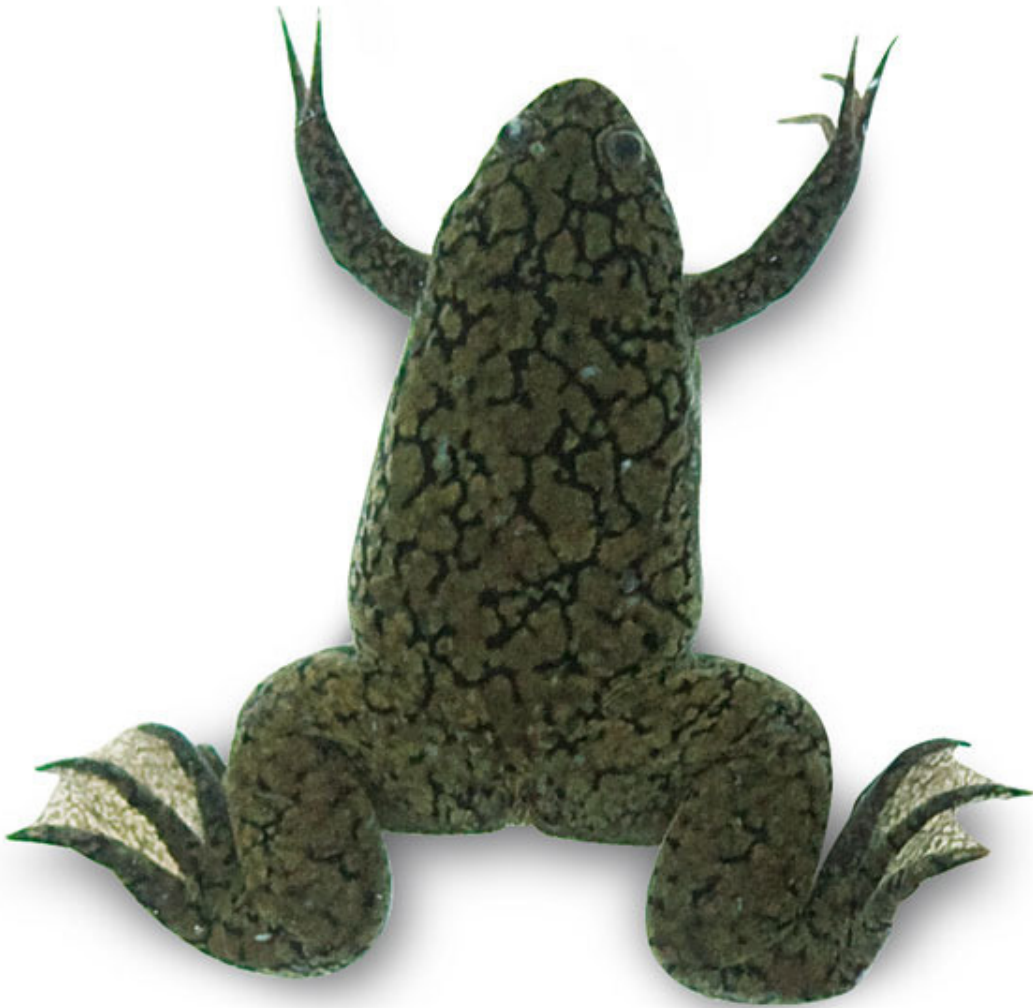


*Drosophila melanogaster*, fruit fly.

#### 4. Common Model Organisms



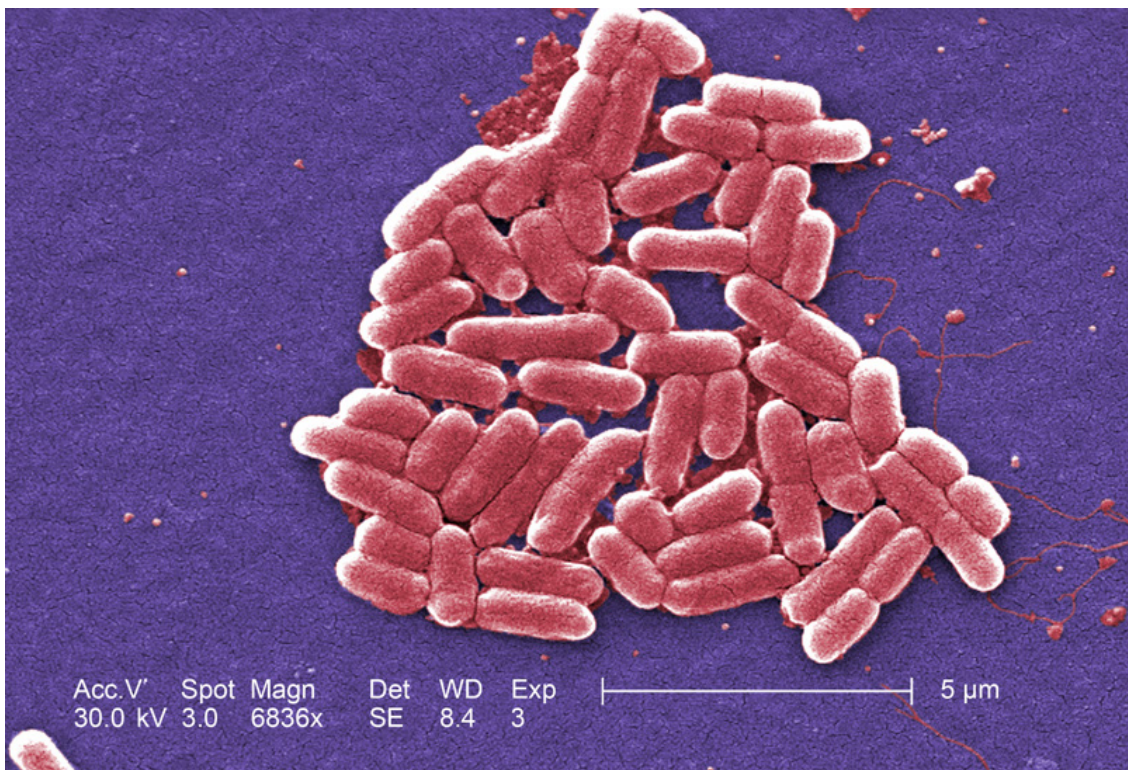
*Xenopus laevis*, African clawed frog.



*Xenopus tropicalis*, western clawed frog.



#### 4. Common Model Organisms



*Escherichia coli*, E.coli.

#### 4. Common Model Organisms



*Saccharomyces cerevisiae*, yeast.

#### 4. Common Model Organisms



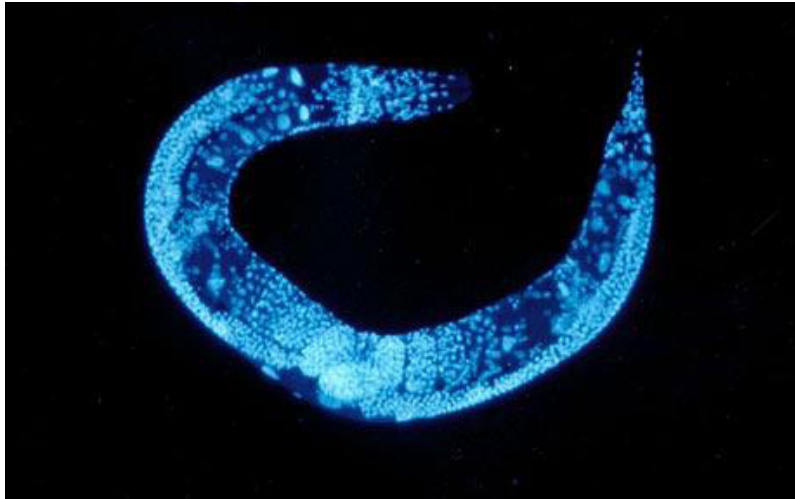
*Dictyostelium discoideum*, slime mold.

#### 4. Common Model Organisms



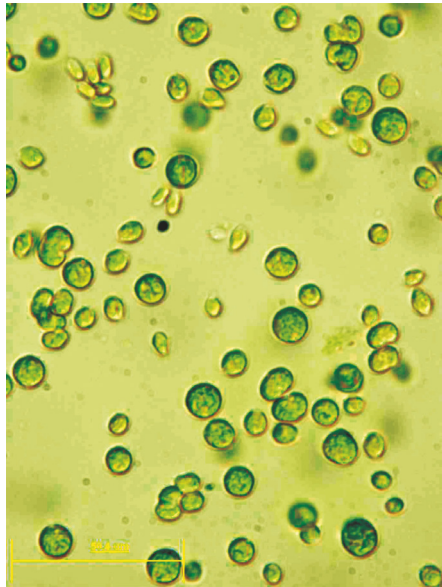
*Danio rerio*, zebra fish.

#### 4. Common Model Organisms



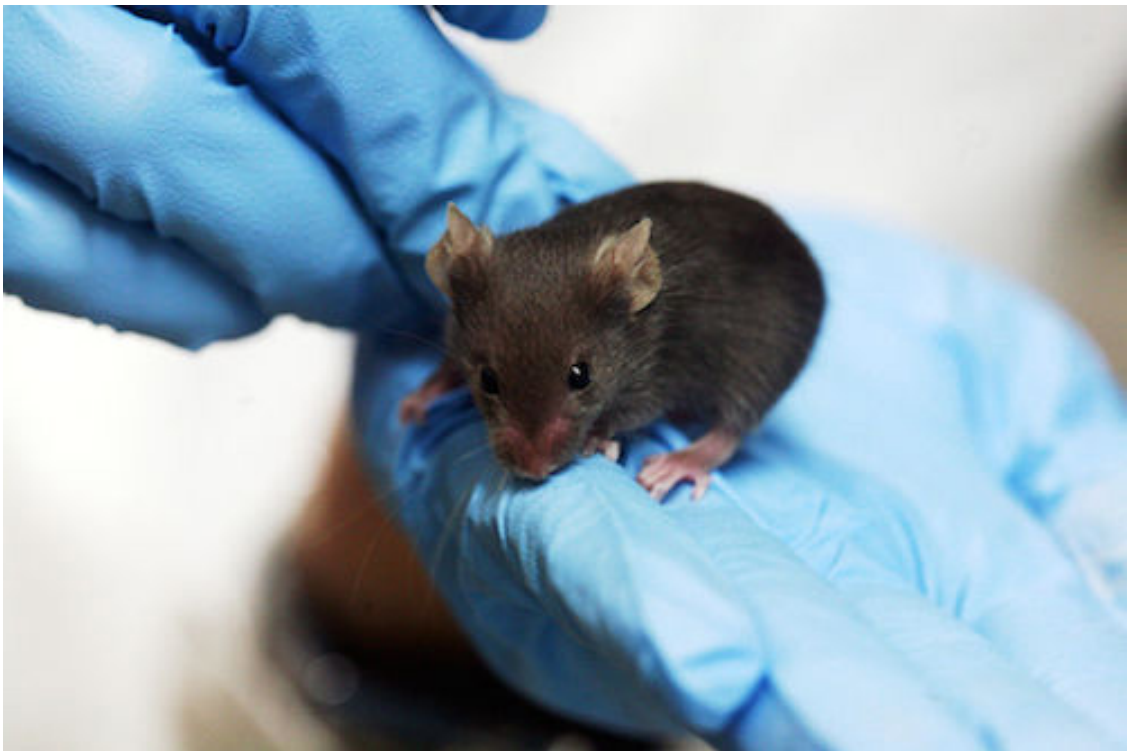
*Caenorhabditis elegans*, *C. elegans*

#### 4. Common Model Organisms



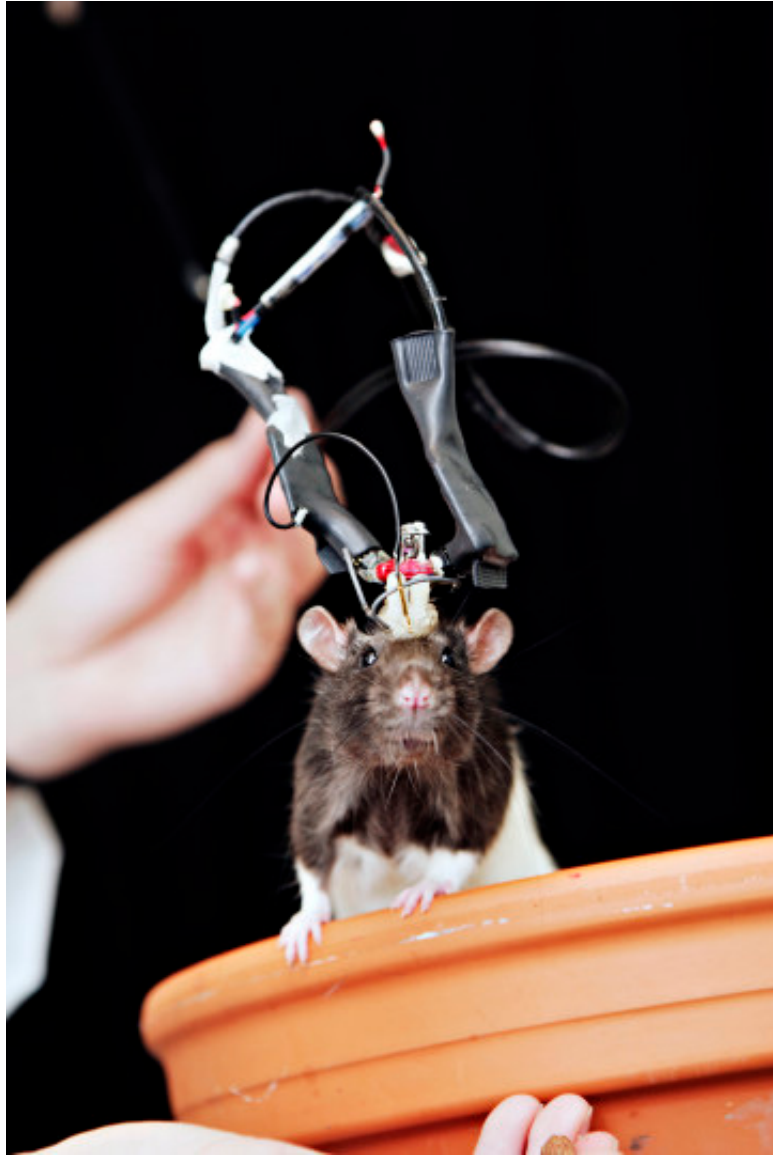
*Chlamydomonas reinhardtii*, *C. reinhardtii*.

#### 4. Common Model Organisms



*Mus musculus*, house mouse.

#### 4. Common Model Organisms



*Rattus Norvegicus*, brown rat.





