

PLANTS WITH SUPERPOWERS

**Purdue Extension
Marion County
Spring Clinic
February 15, 2025**

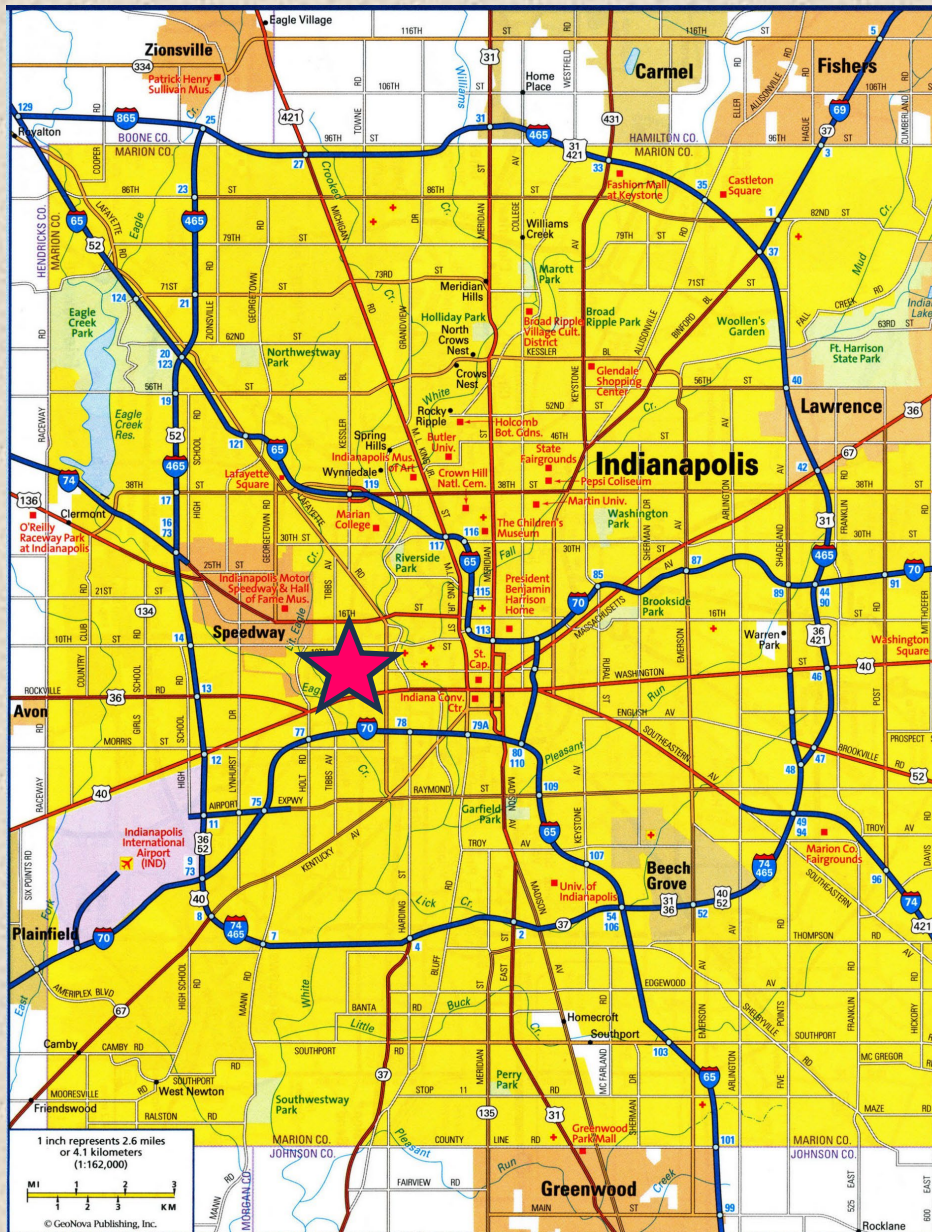
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The Medicinal Plant Garden at the Indiana Medical History Museum

**Kathleen Hull, MD
Head Gardener**



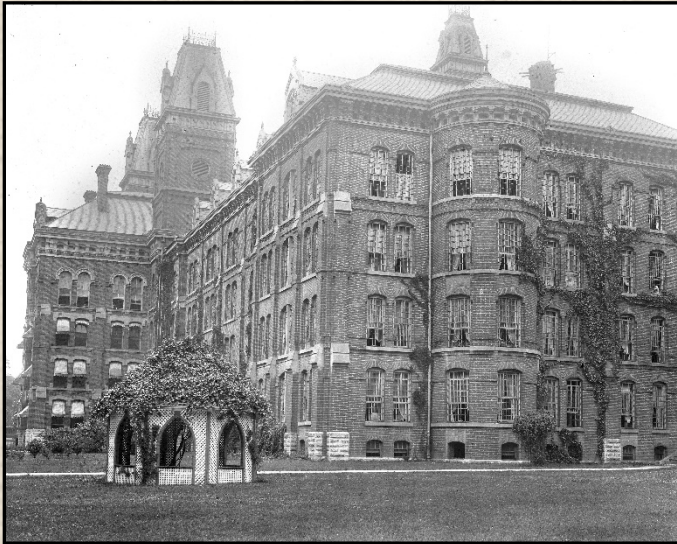
Where is the
Indiana Medical
History Museum?



The Central State Hospital

1846 - 1995

Museum on 6 acres heading east into the “old grove”



New Project #1 - 2017

Indiana Native Tree Arboretum



- 5 acres of old grove and lawn
- mature trees identified & tagged
- 70 new trees planted & labelled
- 59 of the 101 tree species native to Indiana represented to date
- Educational fliers on site
- INPS grant for big sign
- Serve area residents and schools
- Provide a new park-like area for the community
- Council circle of repurposed limestone from IPS



New Project #2 - 2018

Native Prairie Patch in Arboretum

- **A native prairie patch with 80 species planted to date**
- **Educational signage planned**
- **INPS grant for big sign**
- **Serve area residents and schools that can't easily get to parks**
- **Provide a great park-like area for the community**



Indiana Medical History Museum



The Old Pathology Building 1896



Medical Amphitheater

OPB photos are courtesy of Thomas Mueller, MD



Histology Laboratory

OPB photos are courtesy of Thomas Mueller, MD



Historic Doctor's Office Exhibit

Dr. Marion Scheetz on the Old National Road



Medicinal Plant Garden

Project of Purdue Extension Master Gardeners of Marion County Garden began in 2003

Research!
Started small
2 beds and 50 species

130 species in 2021

All plants and materials donated



Project of Purdue Extension Master Gardeners of Marion County

All plants, materials, and labor donated

THANK YOU!



GRANTS

GARDENERS



Garden Endowment FUND

THANK YOU!



**Gardeners
Other individuals**

Currently – \$30,763

www.imhm.org

The Garden Endowment Fund

of the
Indiana Medical History Museum

Medicinal Plant Garden
Indiana Native Tree Arboretum
Prairie Patch



RECOGNITION BRICKS

in the Garden Path
&

NAMED TREES
in the Arboretum

Garden expansions



New hardscape



Thanks to MG Patricia Angotti

The Vincent Angotti Memorial Fountain
2022

Thanks to the Indianapolis Garden Club
for a gift that completed the hardscape project
in 2024!



Purpose of the Garden: Demonstration & Education

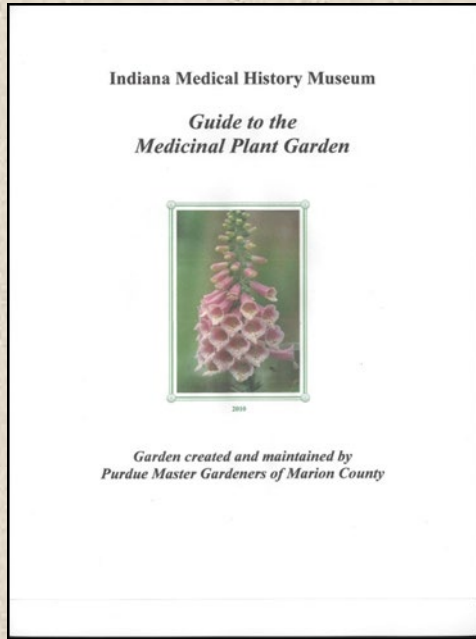
Free public tours – 1st & 3rd Saturdays, June-September

Group tours by appointment

Guidebook – hard copy and online



Guidebook, Garden Signage, and Lectures



Boneset

(*Eupatorium perfoliatum*)

Until the 1940s, this was listed in the *US Pharmacopoeia* as a treatment for flu. Native Americans used it as a poultice to help heal broken bones. Both Native Americans and pioneers used boneset tea made from the whole above ground part of the plant to treat colds, flu, and malaria. A native plant that grows on the edge of moist woodlands, it blooms in late summer. Large doses may damage the liver, kidneys, or lead to internal hemorrhage.

America

Aerial Parts



Disclaimer: Demonstration, NOT Prescription

Disclaimer

“Demonstration - Not Prescription”

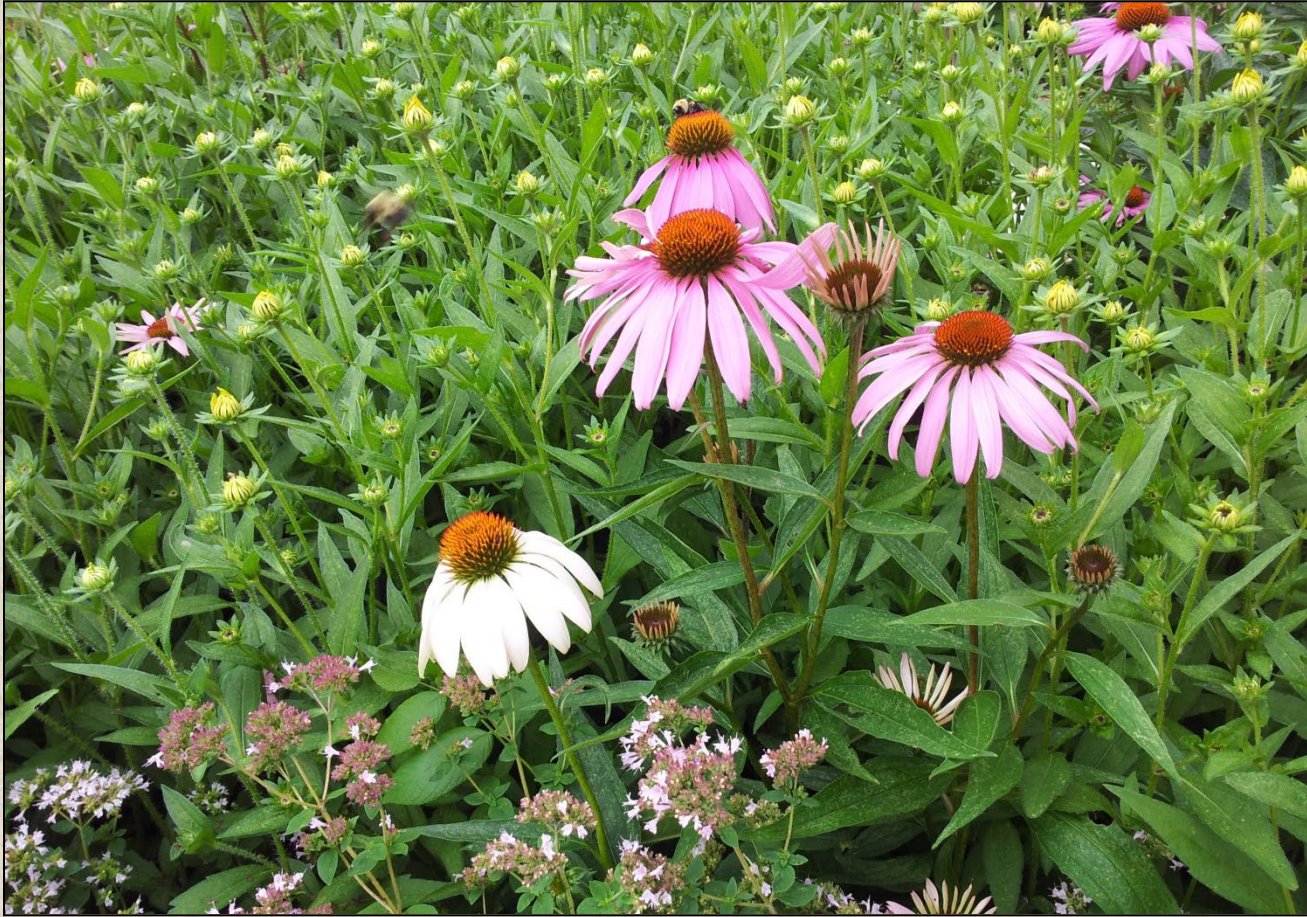
The purpose of the Medicinal Plant Garden at the Indiana Medical History Museum is to demonstrate some of the plants that have been the source of medicines in the past and in the present in order to share interesting historical information. In providing this garden and related written materials and presentations, the Museum and the Purdue Extension Master Gardeners do not intend to endorse the use of current herbal remedies.

Individuals should consult with their health care professionals and make their own informed decisions before taking any medicine, herbal or otherwise. Herbal remedies can have serious side effects and can interact with other medicines.

Medicinal plants can be toxic. Do not pick or ingest any part of the plants in the garden.

Medicinal plants

Common and Unusual



Purple coneflower – Midwestern plains
Echinacea



Lion's tail – South Africa
Leonurus

Trees



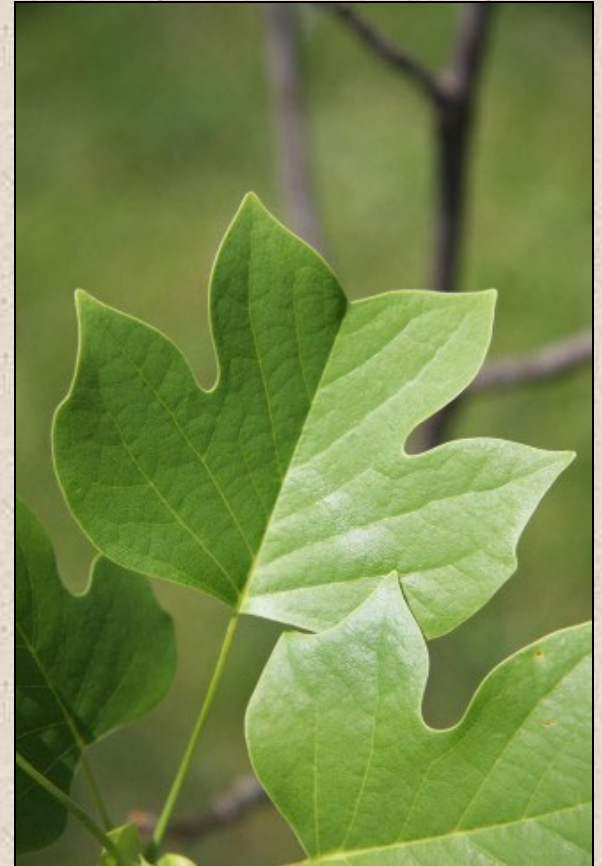
Redbud

Cercis canadensis



Arborvitae

Thuja occidentalis



Tulip tree

Liriodendron tulipifera

Vines



Wild yam vine



Clematis

Hops

Medicinal plants from 5 continents ~ 50% Native Plants of North America



Joe Pye weed
Wild yam vine
Black cohosh
Milkweed

Common Garden Herbs Brought from Europe



Parsley



Sage



Rosemary



Thyme



Dill



Fennel



Mint



Basil

Soothing - Stanching



Aloe



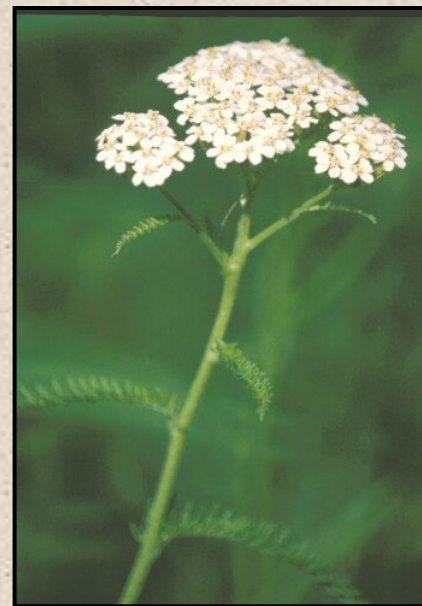
Witch hazel



Lamb's ear



Chamomile



Yarrow

External Healing



Mullein



Comfrey



Arnica

Laxatives



Culver's root



Castor bean



Laxatives



Wild Senna

Fevers, Colds, and Flu



Echinacea



Feverfew



Boneset

Female Hormones - phytoestrogens



Chaste tree



Soy beans



Some “Contraceptive” Plants

Balm of Gilead

Blessed thistle

Cotton root

Dandelion

Dogbane

False Solomon's Seal

Feverfew

Hepatica

Indian hemp

Jack-in-the-pulpit

Milkweed

Partridgeberry

Queen Anne's lace

Skunk cabbage

Tansy

Turtlehead

Water hemlock

Wild geranium

Wild ginger

Wild lettuce

Wild yam

Other “Emmenagogues”

Elecampane

Golden ragwort

Hyssop

Lovage

Oregano

Parsley

Peony

Vervain

Fennel

Hormones

Source of diosgenin for making:

Cortisol

Testosterone

Progesterone



Wild yam vine
Dioscorea villosa



Mexican wild yam vine
Dioscorea mexicana



First birth control pill: Enovid 1960

Medicinal plants – sources of modern wonder drugs

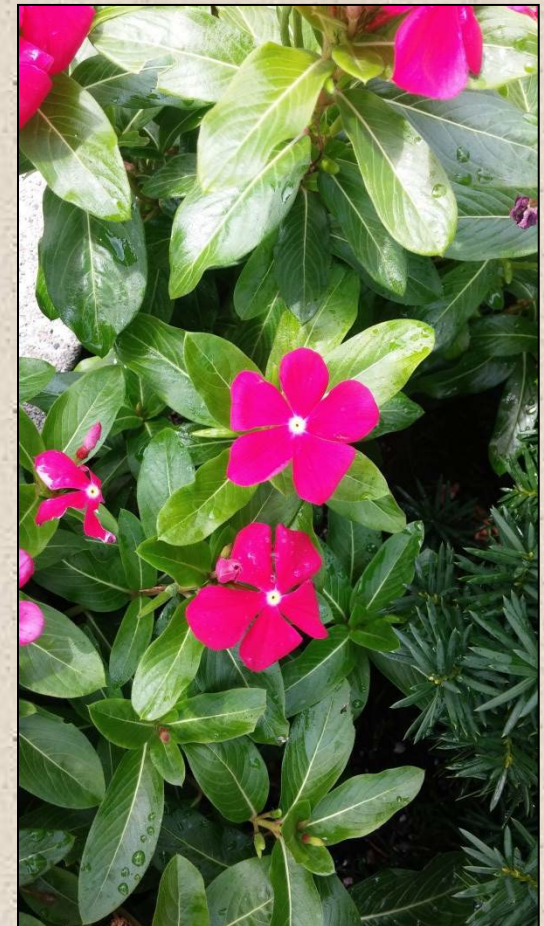
CHEMOTHERAPY



Yew *Taxus*
Taxol
Breast cancer and other cancers



Mayapple *Podophyllum*
Etoposide
Testicular cancer



“Vinca” *Vinca rosea*
Madagascar periwinkle
Vincristine, vinblastine
Leukemia, lymphoma

Medicinal plants – sources of modern wonder drugs



Autumn crocus
Colchicum
Colchicine
Gout



Foxglove *Digitalis*
Digoxin, Digitoxin
Congestive heart failure



Sweet Annie *Artemisia*
Artemisinin
Drug-resistant malaria

Medicinal plants – sources of modern wonder drugs



European meadowsweet
Spiraea ulmaria
Bayer Aspirin



Modern Wonder Drugs from Medicinal Plants - Aspirin



Aspirin now recommended to –

Relieve pain

Reduce fever

Decrease inflammation

Inhibit blood clotting

Prevention of heart attack

Reduce damage of stroke

Prevent cancer

Prevent recurrence of polyps

Aspirin precursors

Salicin ---- Salicylic acid



Common Names White willow, European willow, bai liu

Latin Name *Salix alba*

Family Salicaceae

Parts Used Bark



Common Names Black haw, smooth black haw, sloe-leaved viburnum, cramp bark

Latin Name *Viburnum prunifolium*

Family Caprifoliaceae

Parts Used Bark

For centuries people had used the bark of White willow or Black haw to –

Relieve pain

Reduce fever

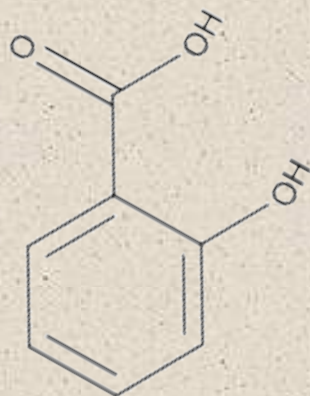
Decrease inflammation

The effects were due to salicylic acid.

*Illustrations from National Geographic
Desk Reference to Nature's Medicine,
by Foster & Johnson*

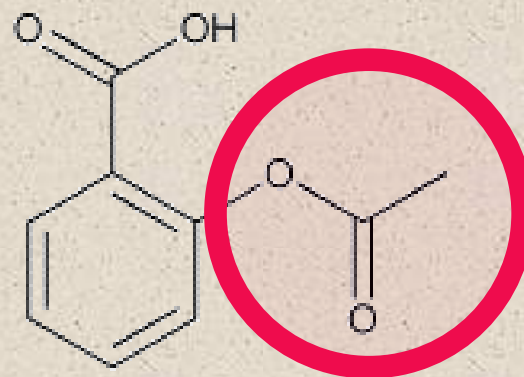
Acetylsalicylic acid

Aspirin



Salicylic acid

Salicylic acid worked, but it caused damage to the lining of the stomach, resulting in gastric pain and bleeding.



Acetylsalicylic acid

Adding an acetyl group to the molecule reduced the bad gastric side-effects.

How Aspirin Works – Acute inflammation

Acute inflammation in the body results in tissues that are red, hot, swollen, and painful.

“Hallmarks of Acute Inflammation”

Acute inflammation may also result in fever.

All these changes are orchestrated by ‘chemical mediators.’



Red Hot Swollen Painful Fever

How Aspirin Works

Cells communicate with each other by using molecules called chemical mediators.

In the acute inflammatory response, prostaglandins are important chemical mediators.

Prostaglandins are created by the cellular enzymes called cyclooxygenase (COX-1 and COX-2).

Aspirin inhibits these COX enzymes.

- * Therefore, cells can't make prostaglandins.
- * Therefore, the acute inflammatory response is arrested.

How Aspirin Works

COX enzymes called cyclo-oxygenase make prostaglandins.

Prostaglandins are mediators of acute inflammation.

Aspirin inhibits the action of cyclooxygenase.

So, cells can't make prostaglandins.

So, acute inflammation can't happen.

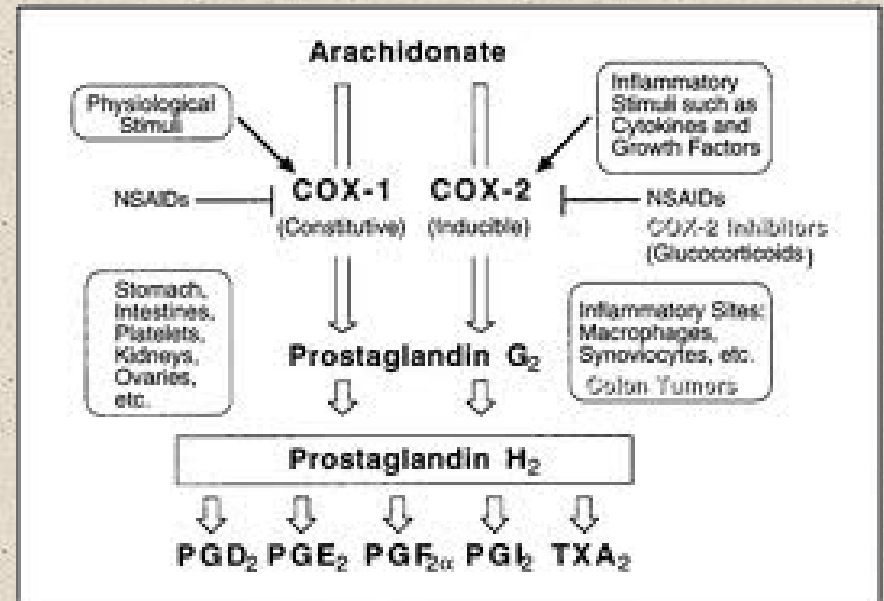
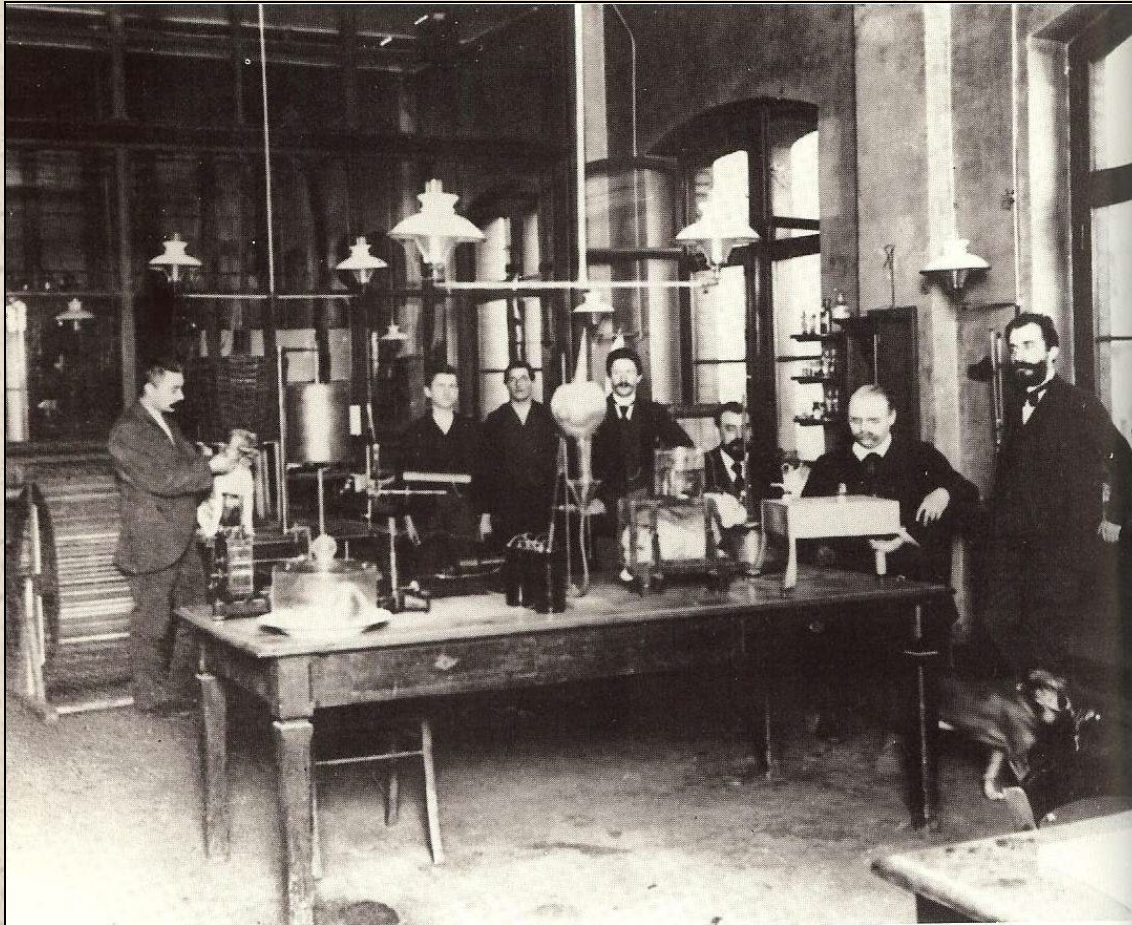


Illustration from *J. Natl. Cancer Inst.* 90(20):1529-1536

Red Hot Swollen Painful Fever

Bayer Aspirin



Bayer Farberfabriken laboratory in Germany, c. 1900

The Photos from *The Aspirin Wars* by Mann & Plumber

Acetylsalicylic acid had been made before, but the Bayer Company patented a new production method in 1897.

They brought their acetylsalicylic acid (named Aspirin) to market in 1899.

Bayer Aspirin -- from European Meadowsweet



Bayer didn't use White willow or Black haw to derive salicylic acid, but rather they used a plant called **European meadowsweet**. The plant's scientific name was ***Spiraea ulmaria***.

They added an acetyl group and named their new drug Aspirin –

A-spirin

A – acetyl spirin – *Spiraea*

Botanists later renamed the plant *Filipendula ulmaria*.

Bayer Aspirin . . . a two-year delay



**Felix Hoffman, Chemist
Bayer Pharmaceutical Section
1897**
Invented the new method for
making acetylsalicylic acid.



**Heinrich Dreser, Director
Bayer Pharmacological Section
1899**
Delayed bringing Aspirin to
market because he was
focused on the other new
Bayer product

Bayer's First Modern Wonder Drugs were:

Phenacetin, 1888

acetophenetidin
(from coal tar residue, not plants)

Heroin, 1898

diacetylmorphine

Aspirin, 1899

acetylsalicylic acid



BAYER

PHARMACEUTICAL PRODUCTS.

We are now sending to Physicians throughout the United States literature and samples of

ASPIRIN

The substitute for the Salicylates, agreeable of taste, free from unpleasant after-effects.

HEROIN

The Sedative for Coughs.

HEROIN HYDROCHLORIDE

Its water-soluble salt.

You will have call for them. Order a supply from your jobber.

Write for Literature to

FARBENFABRIKEN OF ELBERFELD CO.

40 Stone Street, New York,

NEW YORK, N.Y.

Bayer's Heroin



The major causes of death at the time were pneumonia and tuberculosis. Many patients suffered from terrible coughing spells.

Bayer hoped that by modifying morphine, they could create a cough suppressant that was not addictive.

Of course, that didn't turn out to be the case.

Modern Wonder Drugs from Medicinal Plants - Opiates



Morphine, codeine, heroin and other opium derivatives come from the opium poppy.



Papaver somniferum

Modern Wonder Drugs from Medicinal Plants - Opiates



Much of the licit opium is grown in Tasmania.

Other countries producing legal opium from poppies include Turkey, France, Spain, and India.



NOTE:

It is illegal to grow *Papaver somniferum* in the USA.



Modern Wonder Drugs from Medicinal Plants - Opiates

Traditionally, raw opium was collected by making slits cut into the seed pods of the poppy plant.

Since the 1950s there has been a mechanical way to harvest and process the whole pod and now plant.



Opiates – How They Work

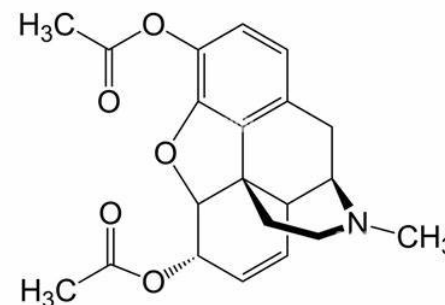
Opiates Act on Many Places in the Brain and Nervous System

Opiates can change the brain stem, an area that controls automatic body functions, and depress breathing

Opiates can change the limbic system, which controls emotions to increase feelings of pleasure.

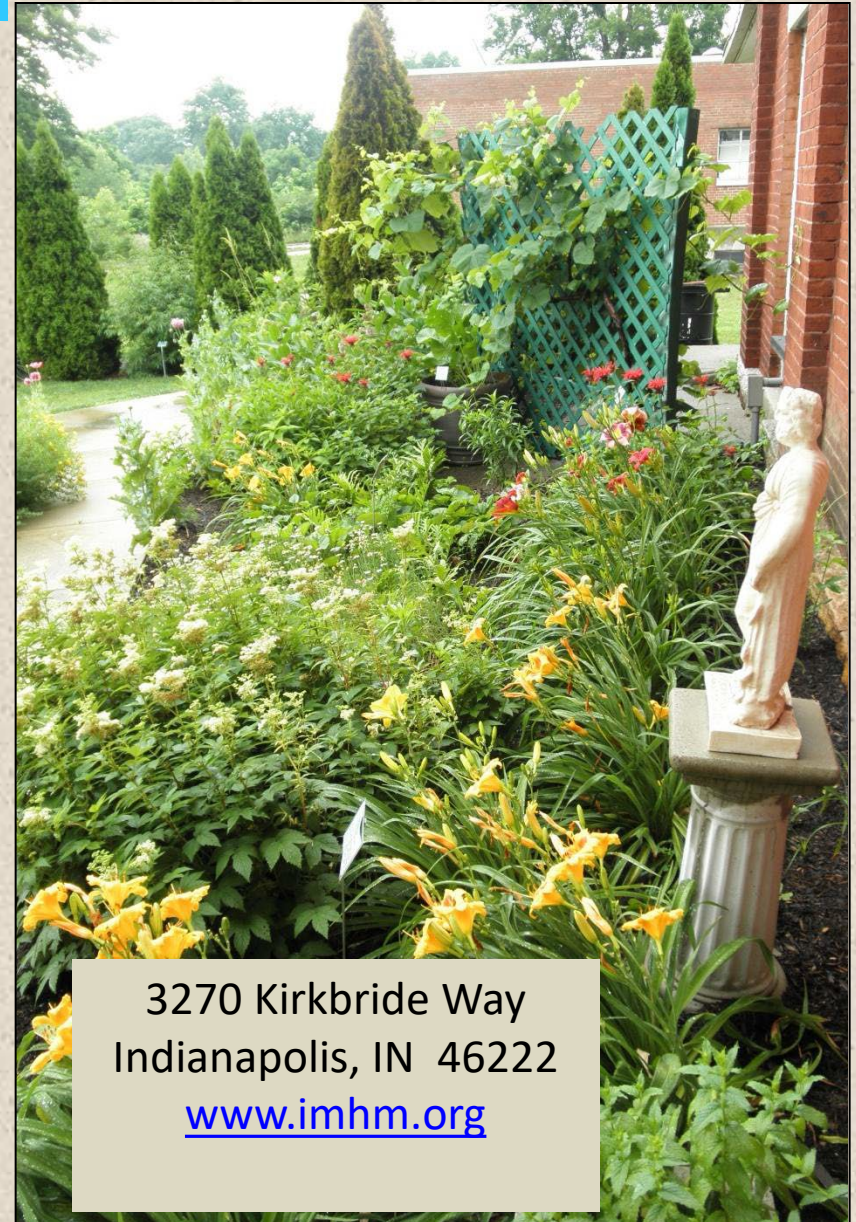
Opiates can block pain messages transmitted by the spinal cord from the body

Heroin



Opiates interact with specific opiate receptors in the nervous system.

The Medicinal Plant Garden at the Indiana Medical History Museum



3270 Kirkbride Way
Indianapolis, IN 46222
www.imhm.org

The Indiana Medical History Museum

on the grounds of the old
Central State Hospital for the Insane



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