

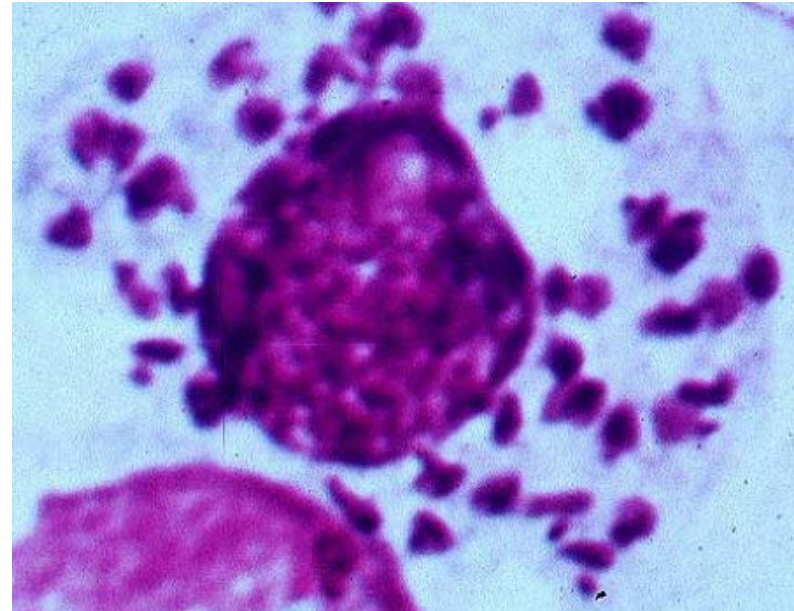
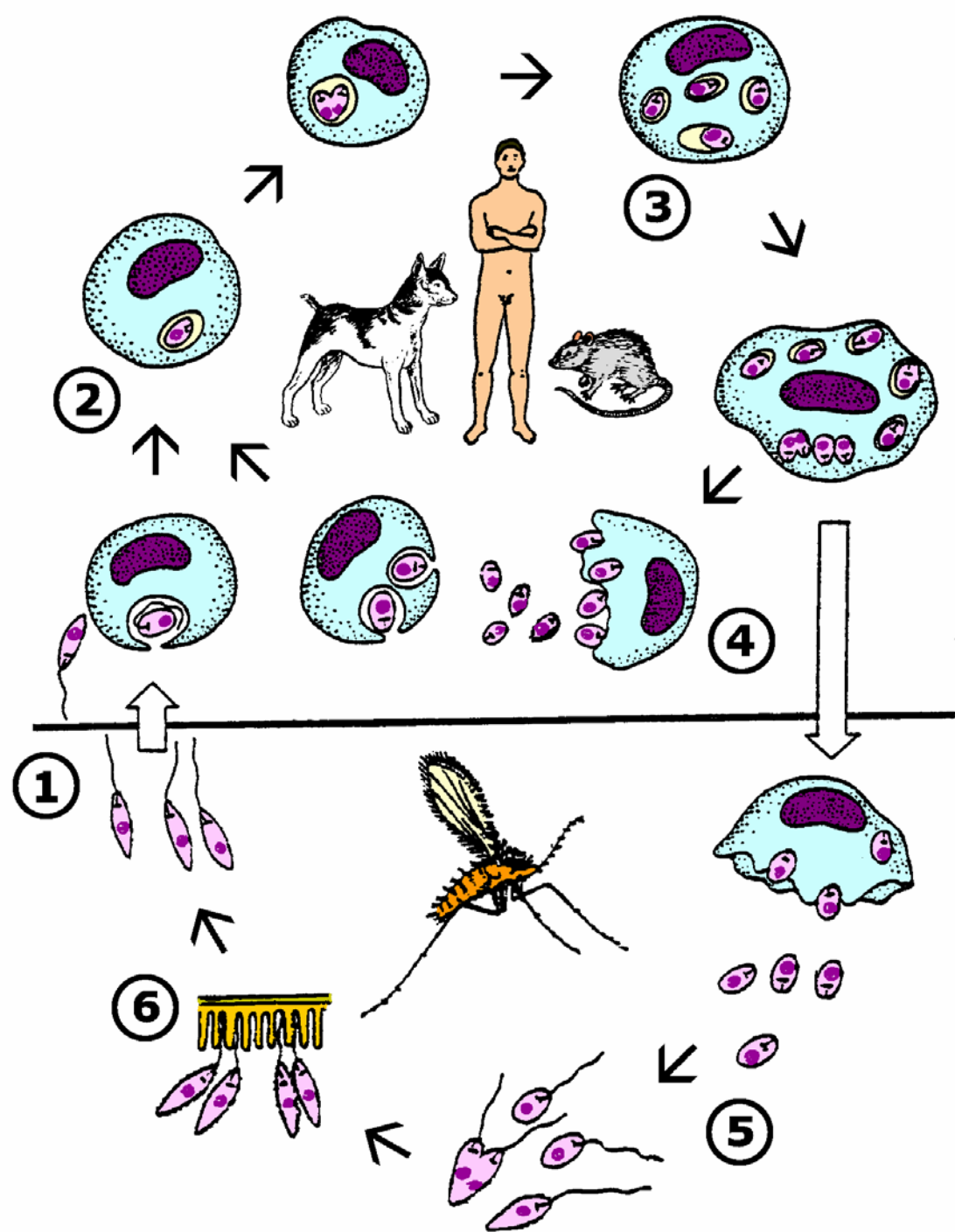
Leishmaniasis

- a variety of disease manifestations
 - focal distribution throughout world, especially tropics and subtropics
 - new world: southern Texas to northern Argentina
 - old world: Asia, Africa, middle east, Mediterranean
 - transmitted by sand flies
 - new world: *Lutzomyia*
 - old world: *Phlebotomus*
- 350 million at risk
 - 12 million infected
 - 1.5-2 million clinical cases/year

Sandfly Transmission



- transmitted via mouthparts
- promastigotes regurgitated from anterior gut
- factors in saliva enhance infectivity
 - immunosuppressive factor?



Clinical Spectrum of Leishmaniasis

Cutaneous Leishmaniasis (CL)

most common form, relatively benign self-healing skin lesions (aka, localized or simple CL)

Diffuse Cutaneous Leishmaniasis (DCL)

rare cutaneous infection with non-ulcerating nodules resembling lepromatous leprosy

Leishmaniasis Recivida

rare hypersensitive dermal response

Mucocutaneous Leishmaniasis (MCL)

simple skin lesions that metastasize, especially to nose and mouth region

Visceral Leishmaniasis (VL)

generalized infection of the reticuloendothelial system, high mortality

Some *Leishmania* Species Infecting Humans

New World Cutaneous, Mucocutaneous, and Diffuse Leishmaniasis	Old World Cutaneous, Recidivans, and Diffuse Leishmaniasis	Visceral Leishmaniasis
Mexicana Complex <i>L. mexicana</i> <i>L. amazonensis</i>	<i>L. tropica</i> <i>L. major</i>	<i>L. donovani</i> <i>L. infantum</i> *
Braziliensis Complex <i>L. braziliensis</i> <i>L. panamensis</i> <i>L. guyanensis</i>	<i>L. aethiopica</i> <i>L. infantum</i> *	<i>L. chagasi</i> **

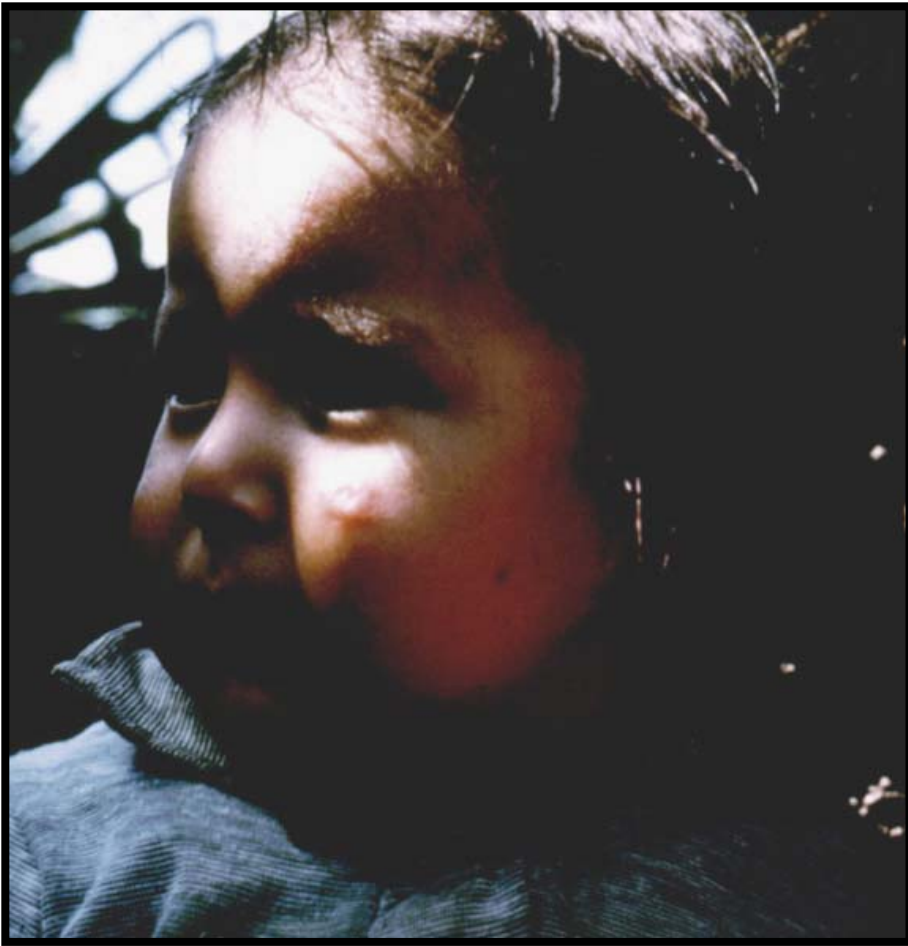
*Both dermatrophic and viscerotropic strains exist.

***L. chagasi* (Americas) may be the same as *L. infantum* (Mediterranean)

Cutaneous Leishmaniasis

- incubation period: 2 weeks to several months
- chronic ulcerated, papular, or nodular lesion
- lesion is painless, non-tender, non-pruritic and usually clean
- self-healing, months to years
- occasionally satellite lesions and/or palpable lymph nodes





- **chronic ulcerated, papular, or nodular lesion**

- **occasionally satellite lesions**





Diffuse Cutaneous Leishmaniasis

- scaly, not ulcerated, nodules
- chronic and painless
- numerous parasites in lesions
- seldom heal despite treatment

L. mexicana

Mucocutaneous Leishmaniasis

- *L. braziliensis* (espudias)
- two stages
 - simple skin lesion
 - 2° mucosal involvement
- can occur long after primary lesion (up to 16 years)
- frequently in naso-pharyngeal mucosae
- metastasis via blood or lymphatic systems
- variable types and sizes of lesions
 - chronic and painless



Mucocutaneous Leishmaniasis

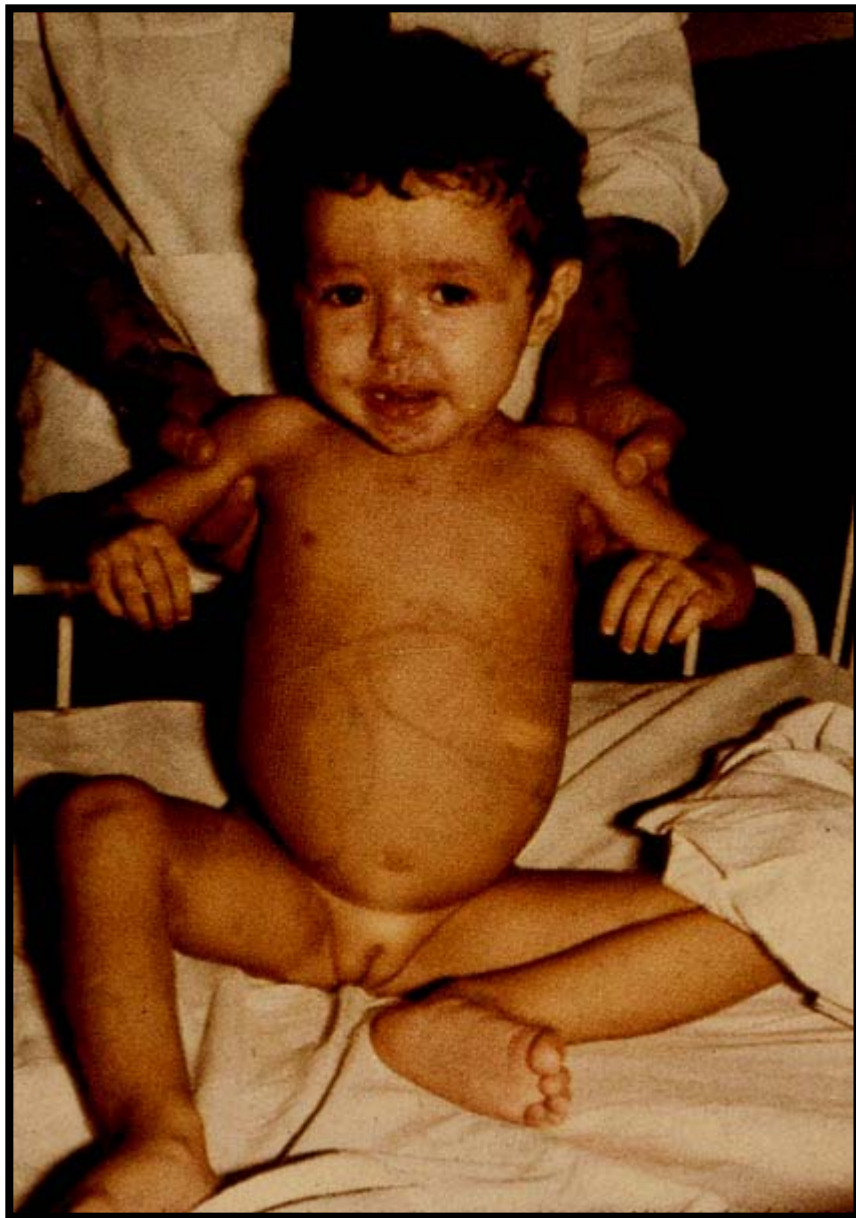


tapir nose

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Visceral Leishmaniasis

- **3 possibly related species**
 - *L. donovani* (Asia, Africa)
 - India (kala azar)
 - *L. infantum* (Mediterranean, Europe)
 - *L. chagasi* (New World)
- **reticuloendothelial system affected**
 - spleen, liver, bone marrow, lymph nodes
- **onset is generally insidious**
- **progressive disease**
 - 75-95% mortality if untreated
 - death generally within 2 years



Clinical Presentation

- **incubation period**
 - generally 2-6 months
 - can range 10 days to years
- **fever, malaise, weakness**
- **wasting despite good appetite**
- **spleno- and hepatomegaly, enlarged lymph nodes**
- **depressed hematopoiesis**
 - severe anemia
 - leucopenia
 - thrombopenia → petechial hemorrhages in mucosa

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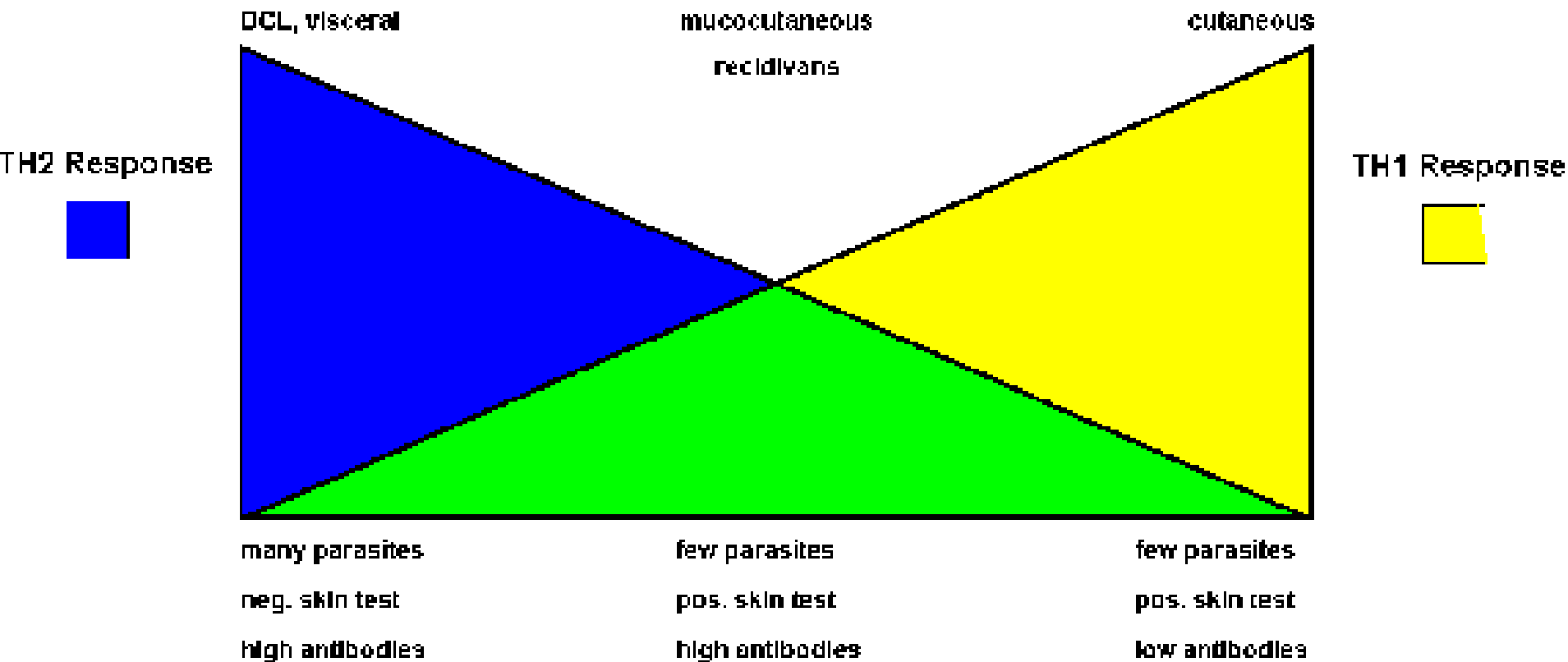
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Disseminated



Localized, Self-healing



- susceptible mice strains exhibit Th2 responses
- resistant mice strains exhibit Th1 responses
- Th1 response stimulates macrophages

Diagnosis of CL, MCL, DCL

- **suspected because of:**
 - **geographical presence of parasite**
 - **history of sandfly bite**
 - **+ skin lesion:**
 - **chronic, painless, 'clean' ulcer**
 - **nasopharyngeal lesions**
 - **nodular lesions**
 - **demonstration of parasite**
 - **delayed hypersensitivity skin test**
 - **serology?**
- **amastigotes**
(scrapings, biopsy, aspirates)
 - **in vitro culture**
(promastigotes)
 - **inoculate into hamsters**

VL Diagnosis

- **suspected because of:**
 - **geographical presence of parasite**
 - **history of sandfly bite**
 - **prolonged fever, splenomegaly, hepatomegaly, anemia, etc.**
- **amastigotes in bone marrow aspirates**
- **in vitro culture of aspirates**
- **serological tests**
 - **direct agglutination**
 - **ELISA dipstick (39 kDa Ag)**

Treatment

- **pentavalent antimonials (eg., glucantime, pentostan)**
 - **20 mg/kg/day, 15-20 days**
- **pentamidine for Sb⁵⁺ failures**
- **amphotericin B**

Control and Epidemiology

- depends on local transmission
- avoid sandfly bites
- bed nets
- insecticides
- destruction of dog reservoir
- ‘tropica vaccine’
 - historical inoculation in covered areas
 - risk of recidiva or VL

New World Dermal

- zoonosis (arboreal mammals = reservoir)
- lowland forest
- occupational

Old World Dermal

- urban = dog reservoir
- rural = rodent reservoir

Visceral

- India (*Ld*): human-fly-human
- Africa (*Ld*): rodent reservoir
- others: dogs (with lesions) are usual reservoir