1. Imunologie hmyzu – hemocyty, specifické barvení hemocytů *G. mellonella* akridinovou oranží (granulocyty), adherence plasmatocytů pomocí přidaných vápenatých iontů, hemocyty *D. melanogaster* značené RFP a GFP, cirkulující/sesilní hemocyty, fotodokumentace.

2. Imunologie hmyzu – nodulace injikovaných bakterií a enkapsulace parazitů, koagulace hemolymfy, melanizace v místě poranění, fotodokumentace.

3. Entomopatogenní hlístice hmyzu a jejich symbiotické bakterie, mikroskopie hlístic a bakterií značených GFP, průběh nákazy, bioluminiscence bakterií a kadaverů měřená luminometricky, fotodokumentace.

4. Modelová nákaza hmyzu entomopatogenními hlísticemi – *G. melonella* a *D. melanogaster*, antimikrobiální aktivita měřená luminiscenčně.

5. Entomopatogenní houby – *Beauveria* sp., nákaza hmyzích hostitelů, kultivace na živném médiu, mikroskopie.

6. Genetika *D. melanogaster* – Actin Gal4 systém řízené exprese genů, křížení driver a responder line, mutantní linie *BcImd*, markery larev a dospělců *Drosophily*.

7. + 8. RNAi linie *Drosophily* – experiment s cnockdown genů zapojených do imunity, důkaz zvýšené citlivosti na bakteriální nákazu.

9. Imunita ryb – odběr krve, roztěry – mikroskopie, stanovení aktivity komplementu luminometricky s použitím *E. coli*, klasická a alternativní cesta, porovnání s jinými metodami – hemolýza erytrocytů, stanovení C3 složky komplementu.

10. Imunita ptáků – odběr krve, oxidační vzplanutí luminometricky pomocí luminophoru Pholasin, důkaz nepřítomnosti MPO u ptačích heterofilů.

11. + 12. Akryalmidová elektroforéza bílkovin hmyzí hemolymfy, rybí, ptačí a lidské plasmy – srovnání hlavních proteinových frakcí, barvení stříbrem.

Hemocyty hmyzu

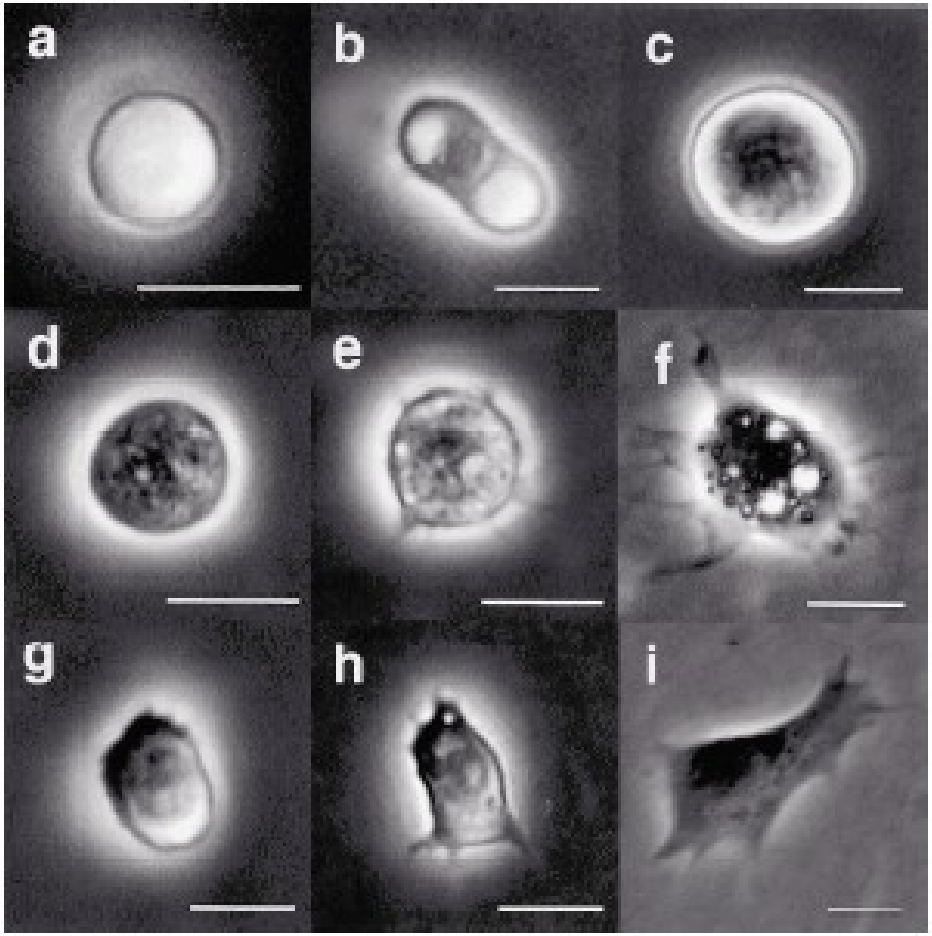
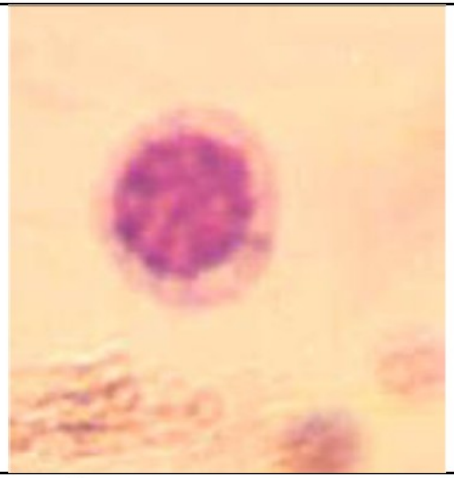
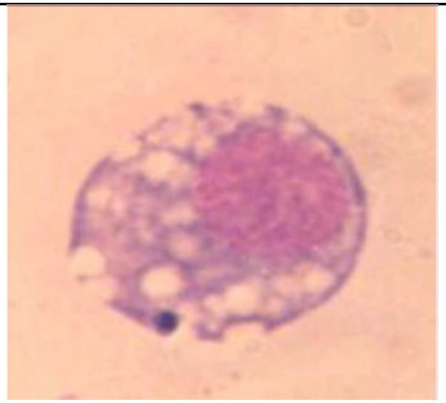
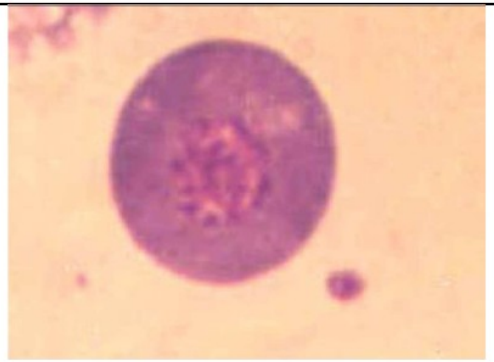
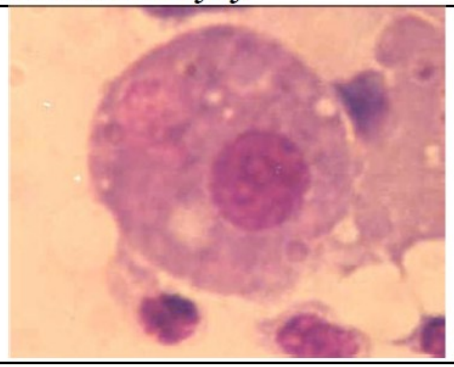
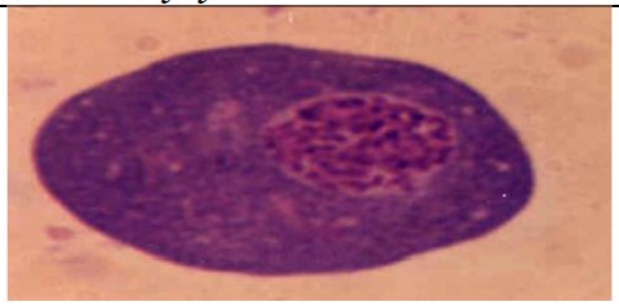
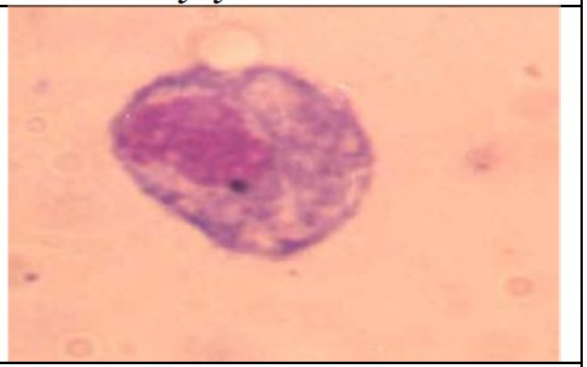


Fig. 1. Morphology of different types of hemocytes first placed into culture. (a) Prohemocyte, (b) spherulocyte, (c) oenocytoid, unlysed, (d) granulocyte, after 10 min of culture, (e) granulocyte, which partially protruded filopodia, after 20 min of culture, (f) fully spread granulocyte, after 40 min of culture, (g) plasmatocyte, after 10 min of culture, (h) early-spreading plasmatocyte, after 2 h of culture, and (i) fully spread plasmatocyte, after 3 h of culture. Scale bar=10 μm.

Hemocyty *B. mori* podle Yamashita & Iwabuchi, 2001.

		
Prohemocyty	Plasmocyty	Granulocyty
		
Coagulocyte	Oenocyty	Dvoujaderné buňky

Sawsan et al. (2010) včela medonosná

5th larval instar of *Galleria mellonella* showed five types of haemocytes; Prohaemocytes, Plasmatocytes, Granulocytes, Oenocytoids and Spherulocytes

Oenocytoids. Hemocytes that are important in the melanization process of hemolymph.

The ***spherulocytes*** comprise less than 10% of the total haemocytes. Their cytoplasm is filled by large granules, or spherules. The material in the spherules gives positive reactions only with histochemical tests for acidic carbohydrates. It is concluded from the results of a battery of histochemical tests, that a sulphated, glycosaminoglycan-like polymer is present. It is suggested that it may be be a heparin-like molecule. Despite many suggestions, the function of the spherulocytes is not known and is discussed in relation to the contents of the spherules.

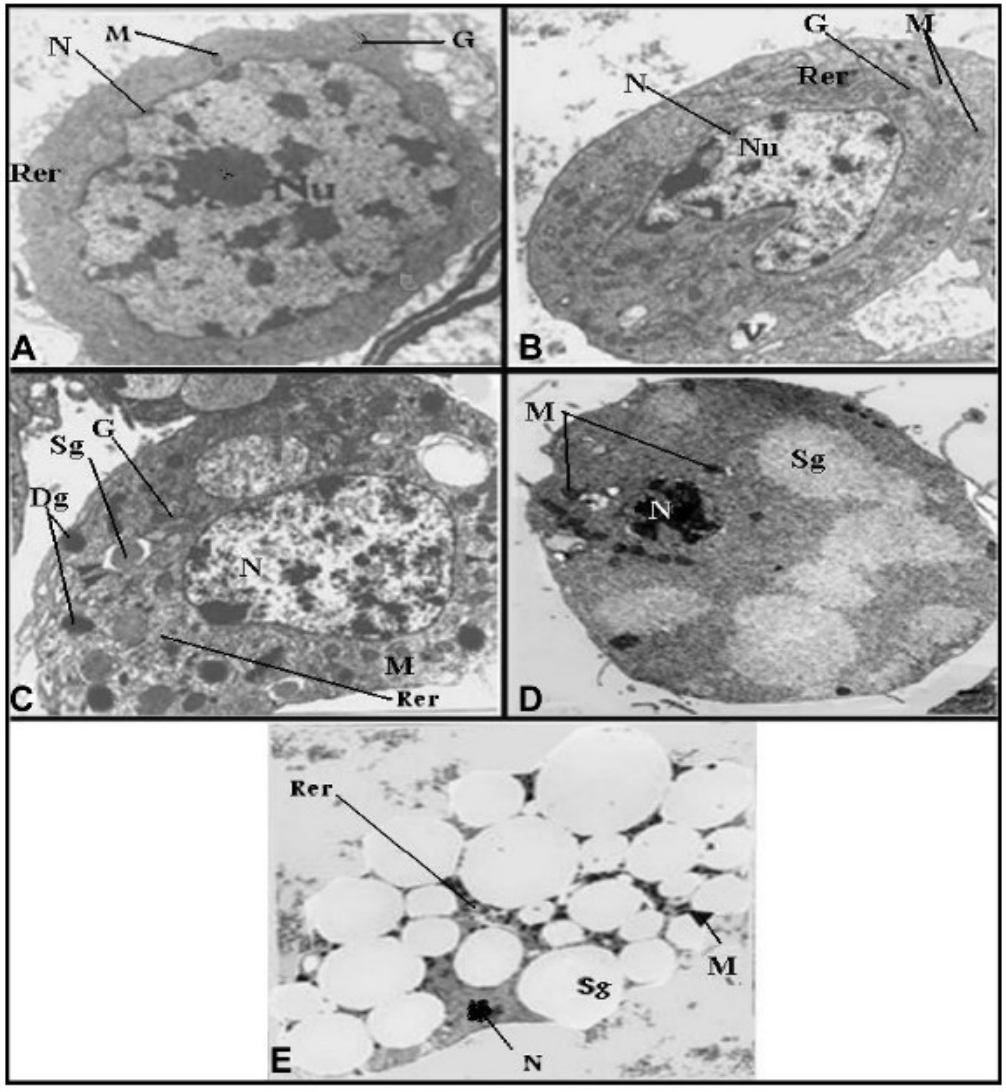
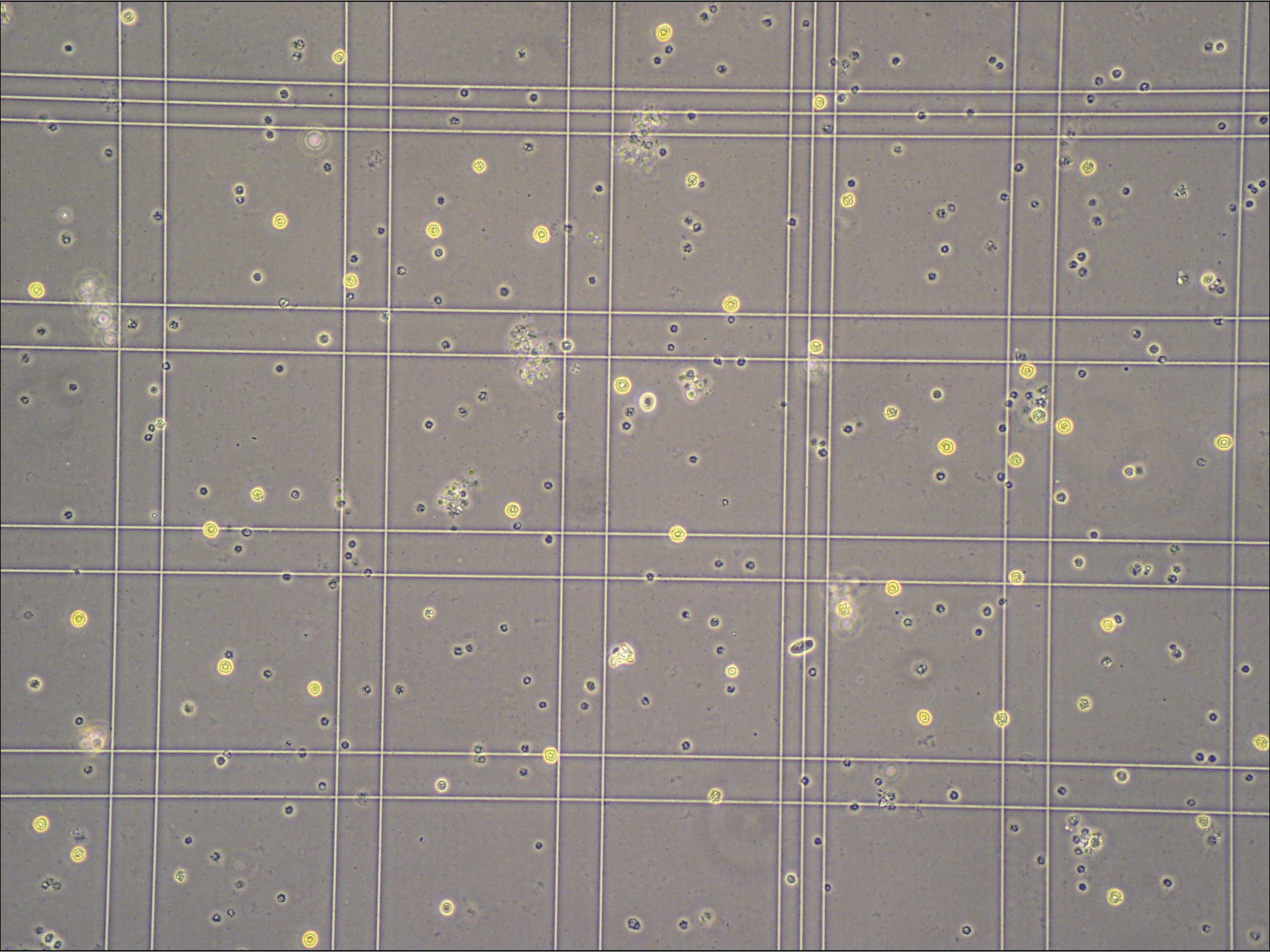
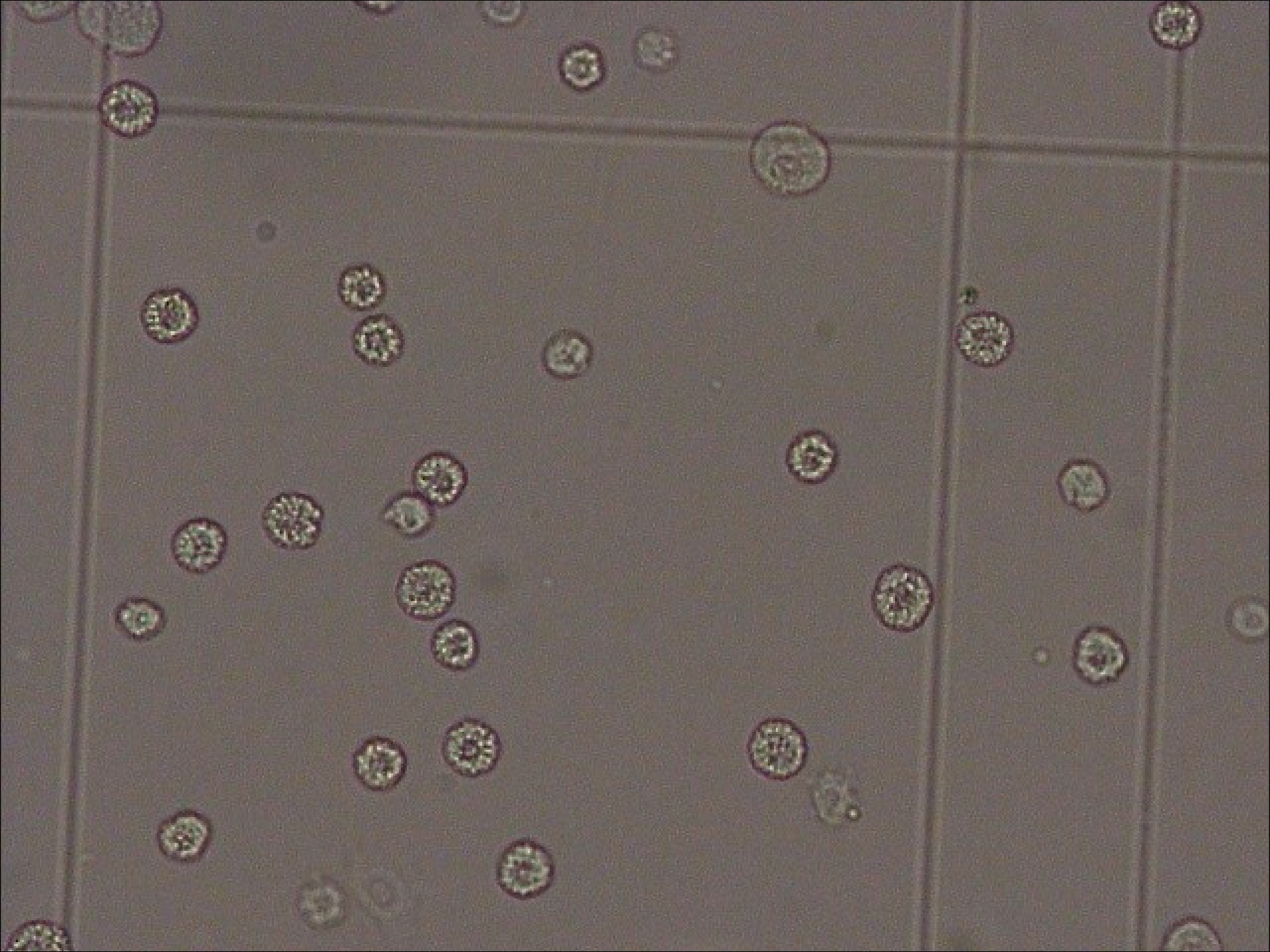
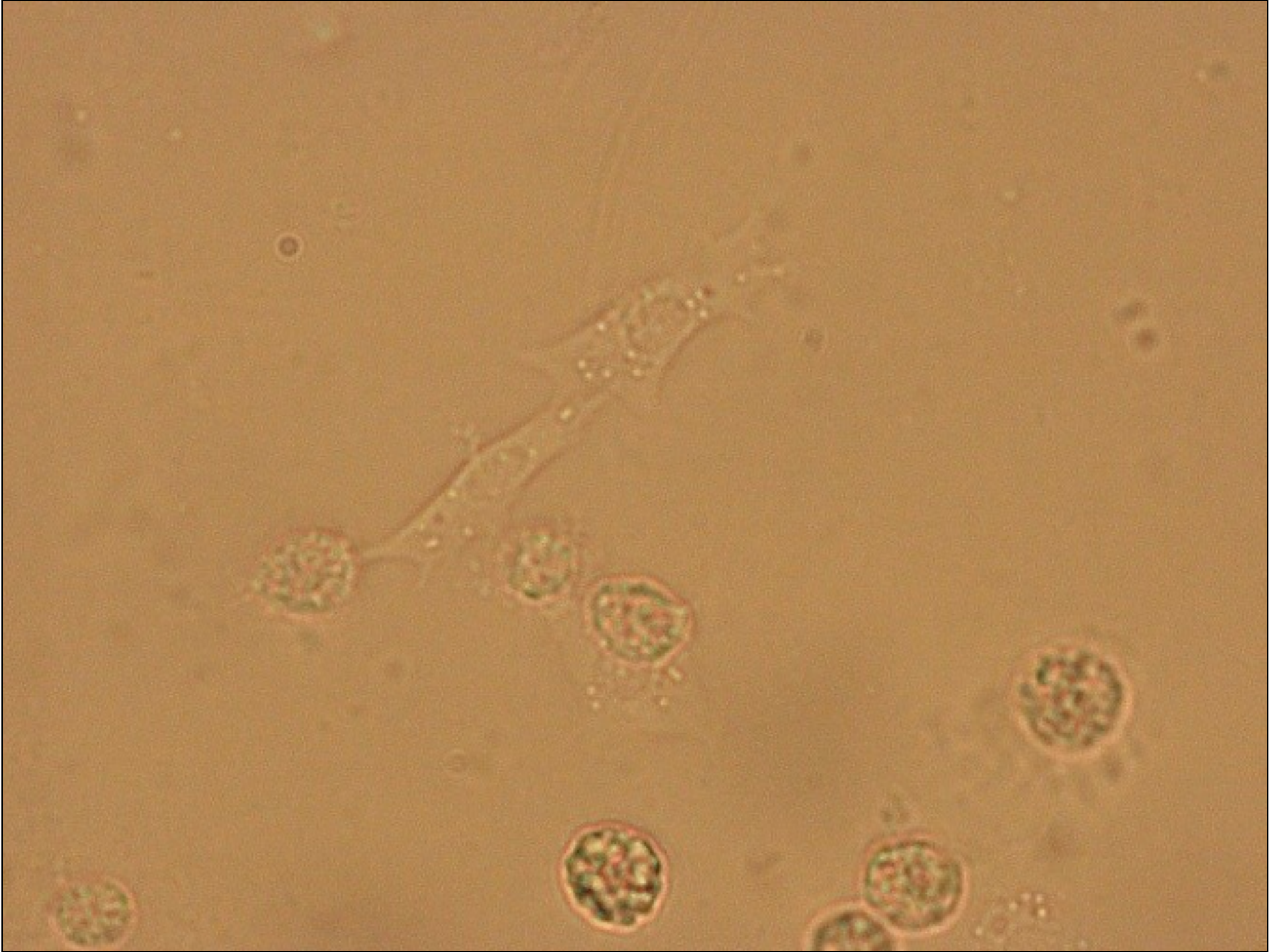


Fig. 1 – Ultrastructure of normal haemocytes of 5th larval instar of *G. mellonella* (TEM mag. = 12 Kx, bar: 2 nm). (A): Prohaemocytes; (B): Plasmatocytes; (C): Granulocytes; (D): Oenocytoids; (E): Spherulocytes.







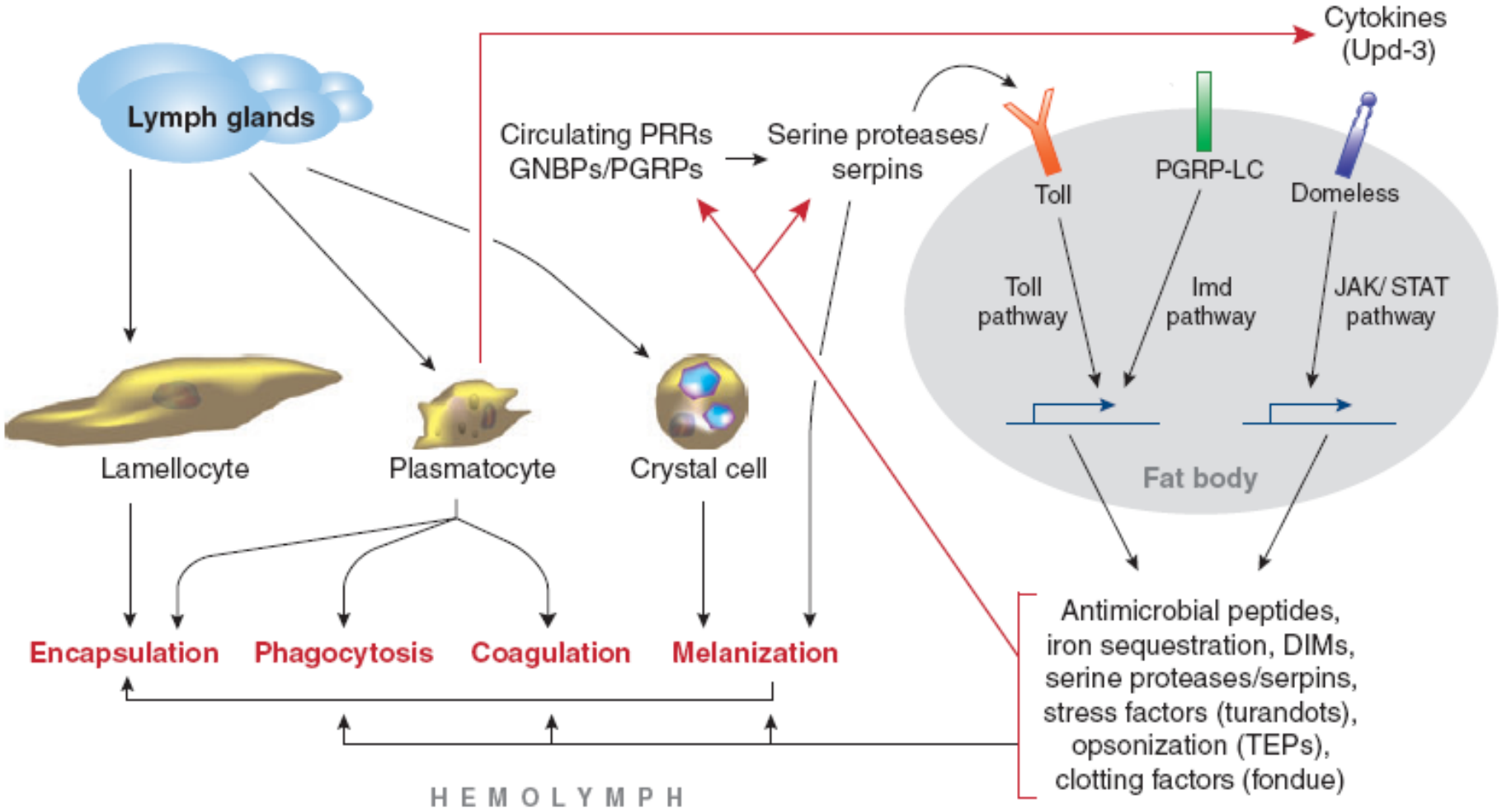


Figure 1

Schematic overview of *Drosophila* host defense. Detection of microbial pathogens elicits a large array of interconnected and synergistic defense modules in immune-responsive tissues.

Lemaitre and Hoffmann 2007

Expand

Drosophila cellular immunity: a story of migration and adhesion

PowerPoint Slide for Teaching

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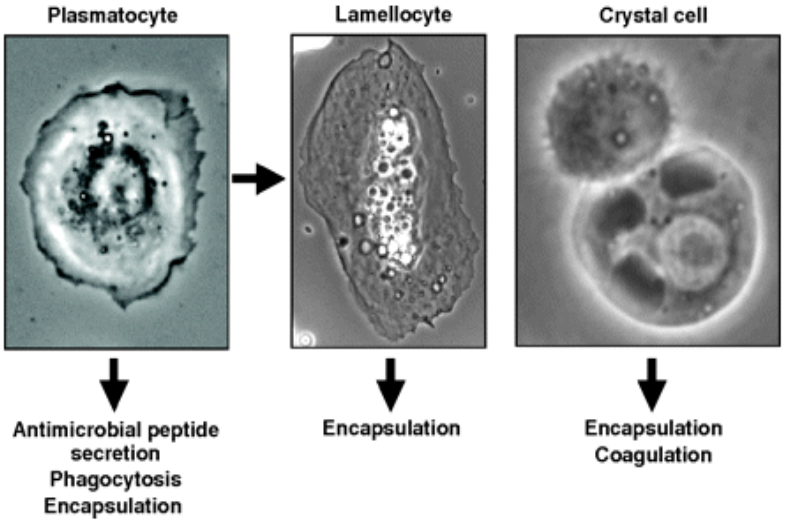

Fig. 2.

***Drosophila* haemocyte subtypes.** Plasmatocytes resemble the mammalian monocyte macrophage lineage and are involved in phagocytosis, encapsulation and the production of antimicrobial peptides. Lamellocytes, which are rarely seen in healthy larvae, are larger than other haemocytes and are involved in the encapsulation of invading pathogens. Many lamellocytes derive directly from plasmatocytes, as indicated by the arrow. Crystal cells rupture to release components of the phenol oxidase cascade, involved in the encapsulation process of invading organisms, coagulation and wound repair. The image of the crystal cell has been kindly provided by Ulrich Theopold.

This Article

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https://www.youtube.com/watch?v=BsAoVNd9MP4