Differentiation of the tissues of the telotrophic ovarioles from the embryonic primordium occurs gradually throughout larval development of bugs. All tissues are established already at the beginning of the last larval stage as observed by Wick & Bonhag (1955) in Oncopeltus fasciatus. During the last instar, when the corpora allata are morphogenetically inactive, the synthetic activity of the cells of first ovarian nutritive system, the trophocytes, takes place. The nutrients released by trophocytes at the final emergence activate the oocytes, starting previtellogenesis (Masner, 1966). The function of this nutritive system is known to be independent of any humoral control (Wigglesworth, 1936, and others). Food intake seems to be the only inductor of trophocyte growth. The developing oocyte grows into the prefollicular syncytium. The surrounding tissue starts to organize into a unilayered epithelium.

The renewal of corpus allatum activity and the release of the juvenile hormone (JH) is necessary for further vitellogenesis. The follicular epithelium, representing the second nutritive ovarian system, has to be activated by the hormone (Wigglesworth, 1936; Pfeiffer, 1936, 1939; Joly, 1945; Engelmann, 1959; Joly, 1960; Highnam, Lusis & Hill, 1963; Sláma, 1964b). The activated cells play an important role in supplying the oocyte with yolk, forming material either regulating or assisting in the transmission of yolk precursors from the blood (Telfer, 1965). Thus JH exerts a direct control of oogenesis, whereas the activation hormone (AH) from the neurosecretory cells is said to regulate this process only indirectly, by making materials available for vitellogenesis (Highnam, 1964).

Oogenesis is inhibited after previtellogenesis in the absence of JH, i.e. when the first nutritive system should be replaced by the second one. The oocytes
deteriorate and are referred to as being resorbed by the invading follicular cells in *Rhodnius prolixus* (Wigglesworth, 1936).

The aim of the present investigation was to study the induction of differentiation of the prefollicular tissue and follicular cells, and particularly the endocrine control of these processes. Moreover, the process of oosporation was examined, especially as to the role of the follicular cells.

**MATERIALS AND METHODS**

Material of allatectomized and cardiac-allatectomized females, operated immediately after the imaginal eclosion, was obtained by the courtesy of Dr K. Sláma. They, as well as controls, were reared together with males at 25 °C and with an 18 h light-day and dissected 15 days after the operations.

The material was treated with Carnoy's fixative, dehydrated and transferred into paraffin through methyl benzoate-celloidin mixture according to Péterfy. It was cut into sections 5 μ thick. The sections were variously stained with Heidenhain's haematoxylin in Masson's trichrome combination, gallocyanin, Una-Pappenheim's method (modification for sections); Brachet's pyronin-methyl green method; toluidin blue controlled by ribonuclease treatment; and Hotchkiss's PARS method (according to Pearse, 1961). The method of Wigglesworth (1959) (OsO₄-ethylgallate followed by ester wax embedding) was used to show cytoplasmic details. Feulgen, celestin blue and a combination of both were used for measuring the size of nuclei. This was done with a calibrated eyepiece. The volume of the nuclei was calculated according to Palkovits & Fischer (1963) using the formula \( V = \frac{1}{6} \pi (LB)^{\frac{3}{2}} \) for spherical and the formula \( V = \frac{1}{6} \pi B^2 \) for elliptical nuclei \( (L = \text{length of the longer diameter}, B = \text{half of the shorter diameter in perpendicular position}) \). The mean value was calculated from 600 measurements and the standard deviation was established.

**RESULTS**

*Control females*

The germarium of the ovarioles of newly emerged females is definitely formed. The connective and peritoneal tissues are fully differentiated, all oogonia having differentiated into trophocytes and oocytes. At the top of the germarium there is still a small group of trophocytes with small nuclei often showing mitotic activity. The nuclei of the trophocytes in lower parts have grown endomitotically and have dense, coarsely granulated, chromatin. They are subsequently converted by autolysis into RNA-rich material, concentrated in the central trophic core, which has just been formed. The lowest part of the core projects into the plasmatic trophic cords in consequence of the growing internal pressure of the nutrients. The cords reach the young oocytes found at the end of germarium. The oocyte nuclei rest in prophase of the first meiotic division.
Follicular differentiation

The prefollicular syncytium of the ovariole of the last stage larvae represents the base of vitellarium. The true vitellarium is organized later, during oogenesis, starting when the adult emerges. The prefollicular tissue remains, however, still preserved at the beginning of vitellarium. It is syncytial with small spherical nuclei, volume $13.02 \mu m^3$ (Text-fig. 1) with few faint chromatin granules, scattered particularly along the nuclear membrane. They show high mitotic activity and there is little cytoplasm (Plate 1, fig. A).

Text-fig. 1. The volumes of nuclei of the follicular epithelium in $\mu^3$ in different stages of oogenesis in normal and operated females plotted on a logarithmic scale. PFT, Prefollicular tissue; PV, end of previtellogenesis; V, end of vitellogenesis; CHF, chorion formation; PV-AE-CAE, end of previtellogenesis in allatectomized and cardiac-allatectomized females; R-AE-CAE, resorption in allatectomized and cardiac-allatectomized females.

The oocytes which have successfully reached the junction with the trophic core by a cord are activated and the first period of oogenesis, previtellogenesis, starts. The trophocytes supply the oocyte with RNA-rich material through the cords (Plate 1, fig. A). The ooplasmic ring swells up and the enlarging oocyte grows into the prefollicular syncytium, which starts to organize into a multilayered epithelium (Plate 1, fig. B). The nuclei of the cells are nearly the same as in prefollicular tissue, dividing occasionally by mitosis. The unilayered epi-
thelium of differentiated columnar cells appears at the end of previtellogenesis (Plate 1, fig. C).

The patches of prefollicular tissue trapped between two neighbouring oocytes differentiate into interfollicular plugs. They consist of long transverse spindle-like cells with elliptical nuclei.

The JH present in the blood induces further changes within the follicular cells just after the unilayered epithelium has been formed. This process begins already before the oocyte completes previtellogenesis. The cytoplasm becomes dense, the nuclear chromatin is endomitotically replicated and the whole nucleus grows rapidly until it fills up much of the cell. Amitotic division of nuclei then begins although cytokinesis does not follow and binucleate cells are formed. The nuclei are situated one above the other and the volume of them both is 75 $\mu^3$ at the end of previtellogenesis (Plate 1, fig. C; Text-fig. 1).

Vitellogenesis begins after the follicular wall is transformed into the epithelium of secretory cells, enabling the material essential for yolk formation to penetrate into the ooplasm. The cells come to be separated one from another by intercellular spaces 0·5–1 $\mu$ broad. This feature corresponds with Telfer's (1961) observation in a saturnid moth. The spaces observed in the vitellogenic follicle have never been observed in previtellogenic follicles of the same ovariole. This suggests that the feature is not an artifact caused by fixation. Material from the haemolymph passes through these spaces. The dense cytoplasm of the follicular cells is rich in RNA, especially along the inner margin of the cells. A narrow ooplasmic layer with faint traces of microvilli alongside the follicular cells also suggests this transport (Plate 1, fig. D). This layer seems to correspond to the follicle cell/oocyte interface recognized by electron microscopy in *Hyalophora cecropia* by King & Aggarwal (1965). The first granules of protein yolk bodies and carbohydrates appear in the cortical layer of the ooplasm. The material passing through the epithelial wall keeps on increasing, particularly after the

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**Plate 1**

Fig. A. Prefollicular tissue with small nuclei at the base of the vitellarium. Young activated oocytes are seen above left and below right; the latter one is attached to the slender trophic core in the middle. Feulgen, celestin blue (FCB).

Fig. B. The multilayered epithelium from the follicular wall of the young previtellogenic oocyte. FCB.

Fig. C. The follicular cells of the oocyte at the end of previtellogenesis. The growing nuclei dividing amitotically are situated one above the other. FCB.

Fig. D. The follicular wall of the oocyte at the beginning of vitellogenesis. Note narrow intercellular spaces, follicle cells/oocyte interface (arrow) and yolk granules. PARS.

Fig. E. The follicular cells of the oocyte at the end of vitellogenesis. Each cell contains two enormously enlarged nuclei side by side with conspicuous nucleoli. Intercellular spaces indistinct. Methyl green–pyronin.

Fig. F. The secretory follicular cells with enlarged nuclei (above) and the interfollicular tissue with small nuclei (below). PARS.
complete obliteration of the trophic cord. The continuous growth of nuclei seems to be an essential condition for this activity. The nuclear volume is 788 \( \mu^3 \) at the end of vitellogenesis and finally 1287 \( \mu^3 \) during chorion formation, which represents a 100-fold increase over the original volume. The nuclei of the majority of the flat cells divide amitotically. They are situated side by side and contain coarsely granular chromatin (Plate 1, fig. E; Text-fig. 1).

The cells of the interfollicular plugs do not follow the same transformation sequences as in the follicular cells. Their cytoplasm remains thin. The nuclei are elongated, but their growth may be negligible. Their chromatin does not increase, and amitosis and binucleate cell formation has never been observed (Plate 1, fig. F).

The follicles emptied after ovulation are shrunken and numerous Feulgen-positive bodies may still be observed. The tissue then disintegrates and is pushed into the mouth of the pedicel, where the corpus luteum is formed (Plate 2, fig. A). This is only slightly RNA-positive. The corpus luteum is characterized by a broad structureless slightly staining mass, representing the transformed wall of the pedicel (Masner, 1966).

Experimental females

The same results were obtained from allatectomized as well as cardiac-allatectomized females. The germarium is regularly arranged, the trophocytes fully functioning, and the vitellarium continuously supplied with activated oocytes. These oocytes grow into the presfollicular tissue, where mitotic activity is still high. The whole course of previtellogenesis, when the oocyte is nourished by trophocytes, is normal. The oocytes complete previtellogenesis and their further development stops.

The growing oocyte is enveloped by a unilayered follicular epithelium, and

PlATE 2

Fig. A. Corpus luteum (middle) between the vitellogenic oocyte (left) and pedicel (right). Note the unstained mass at the border. Heidenhains’ haematoxylin, Massons’ trichrome.

Fig. B. The follicular wall of the oocyte of allatectomized female. Small nuclei are located regularly alongside the outer margin; neither intercellular spaces nor the yolk granules are visible. FCB.

Fig. C. The broadened follicular wall of an oocyte of an allatectomized female, resorbed at the end of previtellogenesis. Note several preserved small nuclei. FCB.

Fig. D. The resorption of oocytes in allatectomized females. The RNA-rich pycnotic material from ooplasm (left) is transferred to the follicular epithelium as the process advances (right). Toluidin blue.

Fig. E. The resorbed body overgrown by the interfollicular tissue and bordered by coherent peritoneal epithelium. PARS.

Fig. F. The space between the resorbed body (right) and the peritoneal epithelium, filled by loose fibrous material with free cells proliferating from the inner envelope. Una-Pappenheim.
individual oocytes are separated by interfollicular plugs. These tissues normally differentiate from the prefollicular syncytium, but further differentiation of the follicular cells, which should give rise to the secretory epithelium, never takes place. The cells remain dormant. Their cytoplasm remains thin, and RNA is found to stain densely only alongside the outer margin of the cells. The nuclei show no progressive development, still retaining nearly the same character and dimensions as those of prefollicular tissue and a volume of 15 $\mu^3$. They are invariably situated alongside the outer margin of the epithelium, occupying no more than a quarter of the total volume of cells. The nuclear chromatin is thin, with faint granules scattered at the nuclear membrane. Amitotic division and binucleate cell formation have never been observed. The cells remain connected one with another and the interfollicular spaces do not develop (Plate 2, fig. B; Text-fig. 1).

Consequently vitellogenesis never takes place and the oocytes deteriorate after the supply of nutrients from the trophocytes ceases. The germinal vesicle disintegrates and vacuoles appear in the ooplasm. The rest of the ooplasm gradually condenses into a mass rich in RNA and quite Feulgen-negative. The massive plasmatic centre is surrounded by a thin, fibrous, slightly acidophilic material. The mass gradually breaks down and the content of RNA decreases. Simultaneously, RNA-rich material passes through the disintegrating follicular epithelium (Plate 2, fig. D). Finally the entire contents of the oocyte are exhausted and only slightly RNA-positive residues remain.

The follicular epithelium disintegrates simultaneously with its oocyte. The epithelium swells up and is about 4 times thicker in the advanced period of resorption. The cell boundaries disappear and numerous toluidin blue-positive droplets of different size, digestible by RNAase, pass through from the ooplasm. They are mostly located at the inner margin, but disappear later on. The nuclei become pycnotic and disintegrate gradually. Feulgen-positive material is rare in comparison with the follicles emptied after ovulation. Several living nuclei may still be found among the debris of the epithelium. These show no apparent changes which could suggest an active role in the process of oosorption. They still retain the original perichromocentrical nuclear type and size—volume, 16 $\mu^3$ (Plate 2, fig. C; Text-fig. 1). Neither mitotic nor amitotic divisions have ever been observed. Similarly no proliferation or lecitolytic cell formations have been found.

The residues of both oocyte and follicle are intermingled and condensed into a formation resembling the corpus luteum. But unlike the latter, the resorptive body is never pushed into the pedicel. These bodies remain as individual units in the vitellarium and are finally overgrown by the tissue of the interfollicular plugs, which are still in good condition (Plate 2, fig. E).

The material from the resorbed oocyte, passing from ooplasm to follicular epithelium and later disappearing, seems to pass to the space between the resorptive body and peritoneal epithelium. It is filled up by a thin, fibrous,
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slightly acidophilic mass. This material is negative both to RNA and DNA acids, as is the residue remaining inside the oocyte after the ooplasm has been exhausted. Numerous free cells are scattered in this material. They arise from patches of cells located originally in the constricted regions between neighbouring oocytes. They represent the remnants of the second sheath of each ovariole, the inner envelope, which disappears in the mature ovary. These cells do not seem to play an important role in the transport of the resorbed material. Their nuclei are spherical, small, and perichromocentrical (Plate 2, fig. F). The fibrous material probably penetrates through the thin peritoneal epithelium to the haemolymph.

DISCUSSION

The process of oogenesis depends upon the activity of two ovarian nutritive systems: the trophocytes, which are differentiated in larval stages, and an active follicular epithelium, the differentiation of which takes place throughout imaginal life. The prefolicular syncytium situated at the base of the vitellarium is the only undifferentiated tissue of the adult ovary. It still retains its larval character. The differentiation of the prefolicular syncytium is a process during which the regular follicular epithelium on one hand and the tissue of the interfollicular plug on the other hand originate by intercellular differentiation (in the sense of Spratt, 1964). This transformation continues by intracellular differentiation of follicular epithelium resulting in formation of the specialized secretory epithelium. The latter process is final; the tissue produced is very stable and its cells have no possibility of further progressive development.

What are the inductors of these differentiation processes? The first step, the differentiation of prefolicular tissue, characterized by the cell wall formation, does not depend upon endocrine control. The true inductor of this process is probably the activated oocyte itself, growing at the expense of trophocytes into the prefolicular tissue. This is a case of cellular interaction and the intercellular differentiation results in the formation of two types of tissues, follicular and interfollicular. This differentiation seems to be determined by the different micro-environment of the responding cells. The follicular cells are exposed to the pressure exerted by the surface of the oocyte, and the interfollicular plug is contracted between two growing oocytes (Masner, 1966). In other words, the transformation of the prefolicular tissue seems to be a response to the changes caused by the growing oocyte. The tissue is stretched and its nuclei separated. This resembles the activation of fat body cells described by Wigglesworth (1964) in Rhodnius, where, however, nutrition is another necessary inducing factor beside the stretching of the tissue. Cell membrane formation is characteristic of this process, but the cells retain relatively great developmental capacity. The mitotic figures, which are still present, can be viewed as evidence of low specialization. Differentiating follicle cells multiply frequently, as observed by King & Koch (1963) in Drosophila where each cell from the very young follicle is
PETR MASNER said to divide four times before the definitive number of follicle cells is reached.

Further development of the oocyte in the period of vitellogenesis requires further differentiation of the follicular epithelium. This process, often called activation, begins during previtellogenesis. The follicular cells develop subsequently into active secretory cells and tremendous growth and later amitotic division of nuclei characterize this transformation (Masner, 1965). The tendency of the follicle cells to undergo endopolyploidy has been demonstrated by Durand (1955) and Schultz (1956). The differentiated follicle cells may contain, according to the latter author, 8–16 times the haploid amount of DNA.

The feeding of the insect, and the concentration of nutrients in the blood, does not have a direct influence on these cells. A comparatively high concentration of proteins and free amino acids has been found in the haemolymph of allatectomized females in many insects (L'Helias, 1953; Highnam et al. 1963), among them *Pyrrhocoris apterus* (Sláma, 1964a). These nutrients are not, however, used for yolk formation in the absence of JH, when the follicular cells remain in a dormant stage, characterized by small nuclei located alongside the outer margin of the mononuclear cells.

The JH appears to be the activator of the follicular cells (Wigglesworth, 1936). This was proved by Novák, Sláma & Wenig (1959) and Johansson (1955, 1958), who succeeded in activating the ovaries by active corpora allata, even in starved females. The direct effect of the AH from the median neurosecretory cells has been reported in this connexion in several insects (Thomsen, 1948, 1952; Gillett, 1955; Girardie, 1963; Wigglesworth, 1965a, b). In *Pyrrhocoris* Sláma (1964a) concluded, in agreement with many authors working on other insects, that AH regulates only digestive metabolism, whereas JH regulates the reproductive metabolism.

The decisive role of JH in follicle activation has been confirmed in the present study by the finding of the same histological picture of the ovaries in allatectomized as well as cardiac-allatectomized females. Highnam et al. (1963) ascertained that in *Schistocerca* the neurosecretory system ceases to release AH within 4 days after allactomy. In *Pyrrhocoris*, nevertheless, there is reason to assume that AH is still present in the haemolymph even in 15-day-old females, such as those used in the present study. Sláma (1964a) found a markedly higher oxygen consumption in allatectomized females as compared with that of cardiac-allatectomized ones, in 15-day-old material. The AH-controlled digestive metabolism is responsible for increased oxygen consumption.

It seems strange that JH appears to induce differentiation of the follicular epithelium of adults yet inhibits morphogenesis of the larval epidermal tissues. This has already been observed by Telfer (1965), who found a hormone indistinguishable from JH to be activator of the final stages of oocyte development. The suggested existence of two different corpus allatum hormones—in larvae (neotenin) and in adults (gonadotropin)—proposed by Lüscher & Springhetti
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(1960) and Sagesser (1960) does not seem to be satisfactory. That a single hormone causes both actions, first suggested by Wigglesworth (1935, 1948, 1954) and Pfeiffer (1945) has been proved (Novák & Sláma, 1962; Sláma & Hrubešová, 1963; Sláma, 1964a) and is now accepted by most authors.

The concentration of the hormone, however, is probably different in each case and the character of the responding cells is also diverse, and, perhaps, the conditions under which the JH acts in larvae and adults are completely different. A final proof that different combinations of simple environmental components could elicit different gene activity patterns would be extremely important (Spratt, 1964). Ecdysone could serve as an example. It is shown by Clever (1965) to induce different processes in different tissues. Furthermore, the reaction to ecdysone is different at different stages of development.

It may be concluded that JH, which inhibits differentiation in larval development, is able to act as an inductor of differentiation of follicular cells in adults. The effect of JH on suppression of differentiation in larvae, however, has been largely based on observations of the epidermal cells. When the imaginal rudiments of inner organs are taken into consideration, the role of JH appears in new light. The example of a gradual differential growth of ovarian imaginal disks during the postembryonic period in Oncopeltus was presented by Wick & Bonhag (1955); the presence of active JH does not interfere with the transformations described. The role of JH in ovarian development in adults appears to be a part of gradual development of the organ. It follows that a striking difference in the action of JH during ovarian organogenesis would not be expected. Novák (1967), in his criticisms of the general validity of Williams's (1961) antiderepression hypothesis of JH action, pointed out that the mechanism of morphogenesis is not only determined in the genetic sense but is largely a result of a complex interaction also involving the intraenvironment (i.e. microenvironment). It follows that the same effector—JH—which suppresses indirectly the differentiation of the larval body does not necessarily interfere with the differential growth of its specific parts; for example, the ovarian tissues of the larva. It seems that JH might also be viewed as an inductor of differentiation in the follicular epithelium in the ovaries of adults.

The oocytes of allatectomized as well as cardiac-allatectomized females deteriorate after they have completed previtellogenesis. The active role of the follicular cells, invading the ooplasm, was described by Wigglesworth (1936) in Rhodnius. A similar feature has often been described in insects, and the proliferation of the cells (lecitolytic cells after Lusis, 1963) has been demonstrated in the oocytes at the beginning of vitellogenesis (Palm, 1948; Lusis, 1963; Davis, 1964; Masner, 1966). The degeneration of oocytes stopped during previtellogenesis, however, is often delayed (King, Rubinson & Smith, 1956; Highnam, 1964). The resorption of the oocytes in allatectomized females has been described in many insects (de Wilde & Boer, 1961). Oosorption in Pyrrhocoris under these conditions is described in the present study. Invading cells were
never observed inside the oocyte surrounded by the dormant cells. These do not take an active role in the transmission of the material from haemolymph into the ooplasm and may also be incapable of transmitting in the opposite direction (Masner, 1965). The material of the degenerated oocyte disintegrates, presumably in consequence of autolysis, and passes through the decomposed follicular wall.

Prabhu, Ittycheria & Nayar (1967) have observed some loose material originating from resorbed oocytes filling up the space between the resorptive body and peritoneal epithelium in Iphita limbata. It was suggested that the free cells described in this region are proliferated from the tissue of the terminal filament and participate actively in the oosorption. This explanation of both the function and origin of these cells, found also in Pyrrhocoris, seems to be questionable.

**SUMMARY**

1. The oocytes of the telotrophic ovarioles of *Pyrrhocoris apterus* are nourished by two nutritive systems: the trophocytes, already differentiated in newly emerged adults, and the follicular epithelium, which must first differentiate from the prefollicular syncytium.

2. This differentiation passes through two periods, induced by two different inductors.

3. The first process is induced by the activated oocyte as it grows into the prefollicular syncytium, which is transformed by intercellular differentiation into the regular follicular epithelium on the one hand, and interfollicular tissue on the other.

4. The second process is induced by JH. The follicular epithelium is transformed by intracellular differentiation into a specialized secretory epithelium. The interfollicular tissue does not change during this period.

5. The growth and amitotic division of the nuclei of the follicular cells is a most sensitive indicator, registering the smallest traces of JH in the blood, long before the first yolk granules appear in the ooplasm.

6. In the absence of JH the follicular cells remain dormant, taking no active role in the transport of the material from the blood to ooplasm and in the opposite direction. The material of the degenerated oocytes penetrates simply through the disintegrating follicular epithelium.

7. The resorptive body is overgrown by the interfollicular tissue, which still retains a great developmental capacity.

8. The free cells found in the material between the resorptive body and peritoneal epithelium originate from the isolated cellular patches of the tissue of the inner envelope, arising in the larval ovarioles.
RÉSUMÉ

Les inducteurs de la différenciation du tissu prélolliculaire et l'épithélium folliculaire dans les ovarioles de Pyrrhocoris apterus (Heteroptera)

1. Les oocytes des ovarioles telotrophiques de Pyrrhocoris apterus sont alimentés par deux systèmes nutritifs, les trophocytes, déjà différenciés chez les adultes nouvellement formés, et l'épithélium folliculaire qui doit se différencier à partir du syncytium prélolliculaire avant son entrée en fonctions.

2. Cette différenciation passe par deux périodes, induites par deux inducteurs différents.

   3. Le premier processus est induit par l'oocyte activé quand il s'accroît dans le syncytium prélolliculaire, qui se transforme, par différenciation intercellulaire, en épithélium folliculaire régulier d'une part, en tissu interfolliculaire d'autre part.

   4. Le deuxième processus est induit par l'hormone juvénile (JH). L'épithélium folliculaire se transforme, par différenciation intracellulaire, en un épithélium sécrétoire spécialisé. Le tissu interfolliculaire ne se modifie pas durant cette période.

5. La croissance et la division amitotique des noyaux des cellules folliculaires constituent l'indicateur le plus sensible enregistrant les plus faibles traces d'hormone juvénile dans le sang, longtemps avant l'apparition des premiers granules de vitellus dans l'œufplasme.

6. En l'absence de JH, les cellules folliculaires restent dormantes, ne prenant pas de part active au transport de matériau du sang à l'œufplasme et dans la direction opposée. Le matériel des oocytes dégénérés pénètre simplement à travers l'épithélium folliculaire en désintégration.

7. Le corps de résorption est recouvert par le tissu interfolliculaire, qui conserve encore de grandes capacités de développement.

8. Les cellules libres trouvées dans le matériel entre le corps de résorption et l'épithélium péritonéal proviennent des groupes de cellules isolés du tissu de l'enveloppe interne, trouvée dans les ovarioles larvaires.

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REFERENCES


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