The phenomenon observed by the author in *M. indica*, M. N. KAMAT and R. B. RAJENDREN, has, however, many features distinct from that obtained by ERIKSSON, in respect of morphology, structure and even manner of formation of basidiospores.

While ERIKSSON noted the occurrence of such a phenomenon under high humidity conditions, the author obtained it under strictly Zerophytic conditions. This probably explains the limited number of crops produced by this fungus. The phenomenon noted by the author in *M. indica* is in the nature of true proliferation, and not repeating basidia[4].

Zusammenfassung. Die Entstehung der sekundären Basidien bei *Muribasidiospora indica*, M. N. KAMAT und R. B. RAJENDREN, und ihre Sporenbildung durch Prolifikation wurde beschrieben.

R. B. RAJENDREN

Maharashtra Association for the Cultivation of Science, Poona 4 (India), 11th April 1967.

[4] Acknowledgment: grateful thanks are offered to Prof. M. N. KAMAT for guidance and interest during the course of this study.

An Autoradiographic Study of the Uptake of ^{3}H-Leucine During Primary Embryonic Induction in vitro

Earlier studies[1,2] imply that the reacting system of primary embryonic induction goes through a phase of determination before the effects of induction becomes histologically visible. To understand the mechanism of primary induction, it is important that one knows what cellular events occur in the reacting system during the determination phase. As a possible approach to this question, a comparison was made during and soon after the determination phase, between protein synthesis in the ectoderm developing under the influence of the dorsal mesoderm and that in the ectoderm not influenced by the same inducing tissue. A comparable study of RNA synthesis in the same induction system has already been published[3].

The ectoderm was isolated from a beginning gastrula of *Triturus pyrrhogaster* and then divided into 2 approximately equal pieces, one of which was fused to a piece of the dorsal mesoderm and cultured in Holtfreter solution (experimental) while the other ectoderm piece was cultured without mesoderm (control). If the culture is extended for more than 4 days, the first piece forms neural tissue, and the other develops into an irregular mass of ciliated cells. Such pairs of explants were cultured for 1, 3, 6, 22 and 48 h at 18 °C, and then incubated in 2 μC/ml of ^{3}H-leucine (10,900 mC/m*M*, Nuclear Chicago Corporation) in culture medium for 3 h after which they were fixed in acetic acid and alcohol. Six μ thick paraplast sections were treated with 5% trichloroacetic acid at 4 °C for 10 min, washed, and then covered with Kodak NTB 3 liquid emulsion.

Silver grains were counted separately per unit nuclear and cytoplasmic areas in each ectoderm explant. The mean value of 75 counts and its 90% confident limits were computed for nucleus and cytoplasm in each ectoderm explant. Comparison of the mean values thus obtained was made between the same cell component of the pair of experimental and control ectoderm. The data are shown in the Table. To ascertain whether a pair of ectoderm explants obtained from the same gastrula gives a valid basis of comparison, a series of control experiments was conducted in which 2 ectodermal explants originating from 1 gastrula were exposed to the labeled precursor. In no pair did we find a significant difference in grain count.

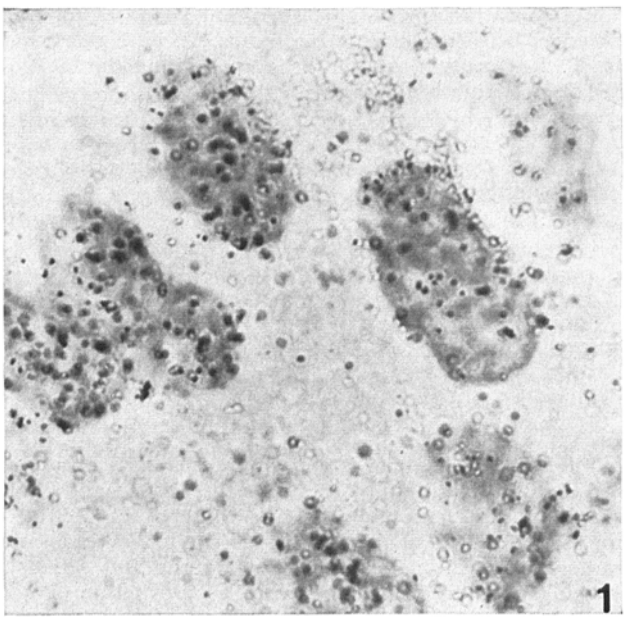
The data summarized in the Table show slight enhancement of uptake in the experimental nuclei for 3- and 22-h groups, and a larger, consistent enhancement in the 48-h group (Figures 1 and 2). In all time groups, regardless of series, the cytoplasm shows values much lower than those of the nucleus. No consistent differences were observed in the cytoplasmic counts between the experimental and control series. Exceptionally low values were obtained for the cytoplasm of the 3-h group. The low cytoplasmic radioactivity throughout all time groups and series is striking. A question may be raised as to whether or not the labeled precursor is first taken up in the cytoplasm,

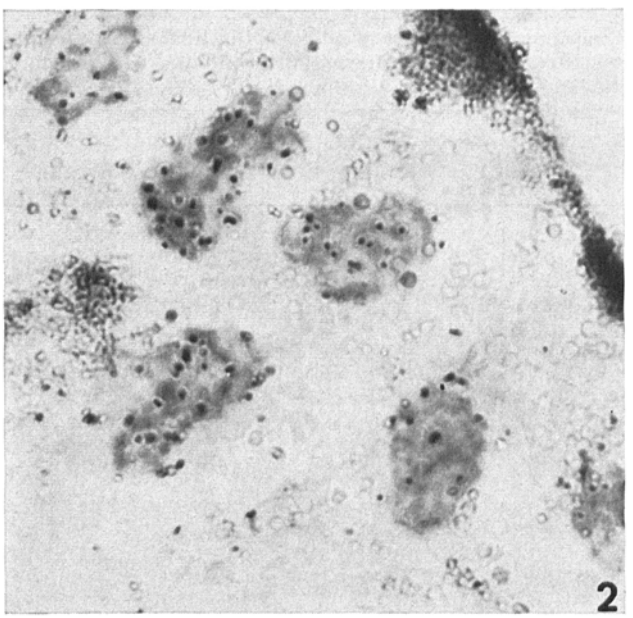
Comparison of grain counts/unit area of induced and non-induced ectoderm cells at various time intervals from the beginning of culture[a]

h	Nucleus		Cytoplasm	
	Experimental	Control	Experimental	Control
1	13.67 ± 0.83	16.01 ± 1.13	4.03 ± 0.33	[b]5.62 ± 0.38
	9.04 ± 0.52	[b]12.63 ± 0.76	2.25 ± 0.04	[b]4.23 ± 0.31
	13.24 ± 1.20	[b]18.37 ± 1.09	6.80 ± 0.76	8.31 ± 0.50
	[b]13.52 ± 1.09	10.75 ± 0.72	4.60 ± 0.38	3.80 ± 0.31
	(0.85)[c]		(0.80)	
3	11.08 ± 0.84	10.67 ± 0.67	0.25 ± 0.02	0.31 ± 0.02
	[b]13.73 ± 0.86	8.12 ± 0.48	[b]0.37 ± 0.02	0.16 ± 0.01
	[b]12.17 ± 0.78	7.91 ± 0.41	0.23 ± 0.02	0.14 ± 0.02
	[b]15.17 ± 1.10	11.05 ± 0.58	0.19 ± 0.02	0.07 ± 0.02
	(1.38)		(1.53)	
6	[b]10.52 ± 0.68	7.92 ± 0.37	4.40 ± 0.26	3.27 ± 0.22
	8.77 ± 0.47	9.88 ± 0.59	3.73 ± 0.17	3.89 ± 0.24
	14.12 ± 1.15	16.08 ± 1.05	6.16 ± 0.50	[b]8.17 ± 0.73
	18.16 ± 1.28	18.99 ± 1.02	8.77 ± 0.64	9.31 ± 0.53
	(0.98)		(0.94)	
22	[b]18.80 ± 1.10	13.51 ± 0.81	7.55 ± 0.53	6.15 ± 0.46
	[b]14.77 ± 0.78	11.33 ± 0.58	5.16 ± 0.47	4.49 ± 0.37
	[b]20.07 ± 1.22	14.23 ± 0.74	8.07 ± 0.76	6.52 ± 0.51
	13.89 ± 0.88	12.53 ± 0.76	[b]5.68 ± 0.31	4.27 ± 0.83
	(1.31)		(1.23)	
48	[b]23.51 ± 1.09	11.05 ± 0.52	[b]8.36 ± 0.55	3.80 ± 0.83
	[b]27.20 ± 2.54	14.44 ± 0.76	[b]13.69 ± 1.61	5.81 ± 0.44
	[b]19.64 ± 1.09	11.89 ± 0.54	5.63 ± 0.54	4.75 ± 0.44
	[b]19.85 ± 1.42	13.44 ± 0.83	6.09 ± 0.91	5.49 ± 0.53
	(1.77)		(1.70)	

[a] The average of 75 counts is accompanied by 95% confidence limits. Each row indicates a pair of data to be compared, derived from the same ectoderm. [b] The difference is significant with $P < 0.05$. [c] Ratios of experimental to control counts for each time group are in parentheses.

[1] O. MANGOLD, Wilhelm Roux Arch. EntwMech. *117*, 584 (1929).
[2] F. E. LEHMANN, Wilhelm Roux Arch. EntwMech. *117*, 312 (1929).
[3] S. K. BRAHMA, J. Embryol. exp. Morph. *16*, 203 (1966).





Figs. 1 and 2. Autoradiographs of ectoderm cells labeled with ^{3}H-leucine. The focus is on silver grains. Cytoplasmic pigment granules and stained nuclei are out of focus. Fig. 1. 48-h, induced ectoderm; Fig. 2. 48-h, non-induced ectoderm.

and then the radioactivity is transferred into the nucleus during the 3-h interval. To test this possibility, incorporation of ^{3}H-leucine was studied by exposing the ectoderm to the labeled precursor in vitro for various time intervals ranging from 5 min–2 h (D. H. REESE and S. K. BRAHMA, unpublished data). The results indicated a gradual increase of radioactivity in the nucleus as incubation time progressed, and very low radioactivity in the cytoplasm throughout the whole incubation time. This suggests that the nuclear radioactivity observed in the present experiment represents direct incorporation of the precursor into the nucleus. A number of published papers[4–6] also suggest that in embryonic cells the incorporation of amino acid into the cytoplasm is relatively low compared with that into the nucleus. Two factors may have contributed to the low value of cytoplasm in our experiments: (1) occupation of the bulk of the cytoplasm by yolk granules which were inactive in protein synthesis; (2) correspondence of the developmental stages investigated to a period prior to the massive production of ribosomes[7] needed for intensive protein synthesis in the cytoplasm.

In summary, no drastic change in ^{3}H-leucine uptake is caused in the ectoderm by the dorsal mesoderm during the determination phase which corresponds to 1-h–22-h groups. Whether the slight and not very consistent enhancement of uptake in the nucleus of the induced ectoderm suggested in the 3-h and 22-h groups is real or not can only be decided by more precise experiments. After completion of the determination phase, in the earliest phase of histogenesis (the 48-h group), the nucleus of induced ectoderm shows an uptake which is significantly and consistently higher than that of the non-induced ectoderm. The cytoplasm is very low in uptake and does not show consistent differences between induced and non-induced ectoderm during and soon after the determination phase[8].

Zusammenfassung. Mit Hilfe von radioaktiv markiertem Leucin wird gezeigt, dass das Mesoderm seine Induktionswirkung auf das Ectoderm ausübt, bevor histogenetische Differenzierung einsetzt.

S. K. BRAHMA and T. YAMADA

Biology Division, Oak Ridge National Laboratory, Oak Ridge (Tennessee 37831, USA), 16th May 1967.

[4] C. H. WADDINGTON and J. L. SIRLIN, J. Embryol. exp. Morph. *2*, 340 (1954).
[5] J. L. SIRLIN, Expl Cell Res. *11*, 197 (1956).
[6] E. M. DEUCHAR, Acta Embryol. Morph. exp. *6*, 311 (1963).
[7] D. D. BROWN and E. LITTNA, J. molec. Biol., *8*, 688 (1964).
[8] This research was supported by the U.S. Atomic Energy Commission under contract with the Union Carbide Corporation. S. K. BRAHMA was a Damon Runyon Memorial Fund fellow.

Änderungen der Entladungsfrequenzen des elektrischen Organs bei verschiedenen Verhaltensweisen eines Nilhechtes (*Gnathonemus petersii*)

Es wurden die fast ununterbrochen erfolgenden Impulse von *Gnathonemus petersii*[1–7] hinsichtlich der Änderung ihrer Frequenzen bei verschiedenen Verhaltensweisen untersucht. Bisher erstreckten sich die Untersuchungen auf die Impulsmuster bei Ruhe, bei langsamem Schwimmen, bei schnellem Schwimmen, bei Appetenzverhalten, bei Komfortverhalten und bei Kampfverhalten. Leider konnte eine Untersuchung des Paarungsverhaltens bisher nicht erfolgen. Mir ist kein Bericht über eine Nachzucht von *G. petersii* in Gefangenschaft bekannt.

Material und Methoden. G. petersii wurde gewählt, weil die Funktion des elektrischen Organes gerade bei diesem Mormyriden durch HARDER, SCHIEF und UHLEMANN[2] gründlich untersucht worden war; zudem wird dieser Fisch im Tierhandel relativ häufig angeboten. Die zu beobachtenden Tiere – 8 Stück, die im Durchschnitt 3