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MAMMOGENESIS IN THE OVARECTOMIZED MOUSE:

A study of the effects of Estradiol and Progesterone.

A Thesis presented in partial fulfilment of
the requirements for the degree of Master of
Science in Physiology at Massey University.

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A B S T R A C T

Immature ovariectomized female mice of the NOS albino strain were administered a series of estradiol treatments, and estradiol plus three different levels of progesterone, for 21 days in two separate experiments. Uterine weights, mammary gland areas, duct junctions/unit area, total duct junctions, mammary DNA and RNA were measured for all animals. Statistical analysis was carried out on all data.

At estradiol doses between 0.00125-0.320 ug/day there was a steady increase in uterine weight, while mammary areas, unit junctions and total junctions increased to a peak at 0.020 and 0.040 ug/day estradiol respectively followed by an inhibition at higher levels. Changes in DNA and RNA did not follow this pattern but were more constant.

At all progesterone doses an inhibition in uterine growth was seen when combined with 0.0050 ug/day estradiol, and a maximum was reached when the progesterone was combined with 0.010 ug/day estradiol, above which point the curve remained flat showing an inhibition from growth observed with estradiol alone. The inhibition when 0.0050 ug/day estradiol was combined with progesterone was observed with all other parameters and also the inhibition at high levels of estradiol. However the final levels were higher than with estradiol alone.

(iii)

A third smaller experiment was carried out to show the time course of development of the mammary glands with 0.010 ug/estradiol and 0.010 ug/day estradiol plus 1 progesterone tablet. Mice were slaughtered at 3 day intervals during the 21 day treatment period.

The results are discussed in relation to previous studies on mammary growth in ovariectomized mice and further areas of work suggested.

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C O N T E N T S

	<u>Page</u>
List of Tables	
List of Figures	
List of Plates	
List of Abbreviations	.
<u>Chapter One - Literature Review</u>	
1.1 Introduction	1
1.2 Methods of estimating mammary gland growth	2
1.3 Experimental Methods	3
1.4 Foetal mammatogenesis	3
1.5 Normal pre- and post-pubertal mammatogenesis	4
1.6 Effect of ovarian hormones on mammatogenesis in rats and mice	7
1.7 Pituitary hormones	15
1.8 Pancreatic hormones	22
1.9 Adrenal hormones	26
1.10 Testicular hormones	30
1.11 Thyroid hormones	32
1.12 Placental hormones	33
1.13 Miscellaneous endocrine factors	35
1.14 Reasons for present study	36
<u>Chapter Two - General Method</u>	
2.1 Animal housing	38
2.2 Animal preparation and general experimental method	38
2.3 Histological methods	39
2.4 Biochemical methods	40
2.5 Photographic methods	41
2.6 Statistical methods	41
2.7 Presentation of results	42

	<u>Page</u>
<u>Chapter Three - Experimental I - Estradiol only</u>	
3.1 Method	43
3.2 Results	45
3.3 Discussion	49
<u>Chapter Four - Experiment II - Estradiol plus <u>progesterone</u></u>	
4.1 Method	62
4.2 Results	62
4.3 Discussion	71
<u>Chapter Five - Experiment III - Time Response</u>	
5.1 Method	82
5.2 Results	82
5.3 Discussion	86
<u>Chapter Six</u>	
6.1 General Discussion and Conclusions	89
6.2 Suggestions for further work	96
PLATES.	98
Appendix 1	
" 2	
" 3	
" 4	
References	

LIST OF TABLES

	<u>Page</u>
Table 3.1 Estradiol treatments	44
3.2 Volumes of injected estradiol solution	44a
3.3 Results Expt. I - Log Transformed Data	46
3.4 Analysis of Variance Expt. I	47
3.5 Analysis of Variance with Regression Expt. I	50
Table 4.1 Estradiol and Progesterone treatments	63
4.2 Results Expt. II Log transformed Data	64-65
4.3 Mean Progesterone absorption from tablets	66
4.4 Analysis of variance with interaction Expt. II	67
4.5 Analysis of variance with regression Expt. II	72
4.6 Results of fitting polynomial regressions for Expt. I and II	73-74
Table 5.1 Time Response Results - Estradiol alone	83
5.2 Time Response Results - Estradiol and Progesterone	84

LIST OF FIGURES

Between
Pages

- | | | |
|----------|---|-------|
| Fig. 1. | Final mean body weight versus Estradiol treatment and Estradiol plus Progesterone treatment. Vertical lines represent standard error of mean (S.E.M.) | 47-48 |
| Fig. 2. | Expt. I. Mean log uterus weight versus Estradiol treatment. | |
| Fig. 3. | Expt. I. Mean log total mammary surface area versus Estradiol treatment. | |
| Fig. 4. | Expt. I. Mean log total unit junctions versus Estradiol treatment. | |
| Fig. 5. | Expt. I. Mean log total duct junctions versus Estradiol treatment. | |
| Fig. 6. | Expt. I. Mean log DNA/gland versus Estradiol treatment. | |
| Fig. 7. | Expt. I. Mean log RNA/gland versus Estradiol treatment. | |
| Fig. 8. | Expt. II. Mean log uterus weight versus Estradiol plus Progesterone treatment. | 67-68 |
| Fig. 9. | Expt. II. Mean log total mammary surface area versus Estradiol plus Progesterone treatment. | |
| Fig. 10. | Expt. II. Mean log total unit junctions versus Estradiol plus Progesterone treatment. | |
| Fig. 11. | Expt. II. Mean log total duct junctions versus Estradiol plus Progesterone treatment. | |
| Fig. 12. | Expt. II. Mean log DNA/gland versus Estradiol plus Progesterone treatment. | |
| Fig. 13. | Expt. II. Mean log RNA/gland versus Estradiol plus Progesterone treatment. | |
| Fig. 14. | Expt. III. Mean uterus weight versus days treatment. | 84-85 |

- Fig. 15. Expt. III. Mean total mammary surface area versus days treatment.
- Fig. 16. Expt. III. Mean total unit junctions versus days treatment.
- Fig. 17. Expt. III. Mean total duct junctions versus days treatment.
- Fig. 18. Expt. III. Mean DNA/gland versus days treatment.
- Fig. 19. Expt. III. Mean RNA/gland versus days treatment.

LIST OF PLATES

		<u>Between pages</u>
Plate I.	Expt. I. Estradiol only	98-99
Plate II.	Expt. I. Estradiol only	" "
Plate III.	Expt. II. Estradiol plus 1 progesterone tablet	. 99-100
Plate IV.	Expt. II. Estradiol plus 1 progesterone tablet	100-101
Plate V.	Expt. II. Estradiol plus 2 progesterone tablets	101-102
Plate VI.	Expt. II. Estradiol plus 2 progesterone tablets.	" "
Plate VII.	Expt. II. Estradiol plus 4 progesterone tablets.	102-103
Plate VIII.	Expt. II. Estradiol plus 4 progesterone tablets.	" "
Plate IX.	Expt. III. Time response. Estradiol only.	103-104
Plate X.	Expt. III. Time Estradiol plus progesterone.	104-105

LIST OF ABBREVIATIONS

ug	=	ug = microgram
BW	=	Body weight
DJ	=	Duct junctions
DNA	=	Deoxyribonucleic acid
L-A	=	Lobulo-alveolar
MG	=	Mammary gland
MA	=	Mammary area
RNA	=	Ribonucleic acid
UJ	=	Unit junctions
UW	=	Uterus weight
ACTH	=	Adreno-corticotrophic hormone
Ald	=	Aldosterone
CA	=	Cortisone Acetate
E	=	Estrogen
FSH	=	Follicle stimulating hormone
GH	=	Growth hormone
I	=	Insulin
LH	=	Lutenizing hormone
P	=	Progestin
Prol	=	Prolactin
TP	=	Testosterone propionate
TSH	=	Thyroid stimulating hormone
CRF	=	Corticotrophin releasing factor
GHRF	=	GH releasing factor
FSHRF	=	FSH " "
LHRF	=	LH " "
TSHRF	=	TSH " "
PIF	=	Prolactin inhibiting factor
T ₄	=	Thyroxine
T ₃	=	Triiodothyronine