

Contents

I. Current Views on Androgen Receptors and Mechanism of Androgen Action.

R. K. WAGNER and A. HUGHES. With 2 Figures

1.	Introduction	1
2.	Effect of Androgens on Various Tissues	2
2.1.	Androgen-Responsive Tissues	2
2.2.	Effect on Secondary Sexual Organs	2
2.2.1.	Macroscopical and Histological Responses	2
2.2.2.	Biochemical Responses	3
2.3.	Androgen-Mediated Template Activity of Isolated Nuclear Chromatin	5
2.4.	Androgen Effects on Muscle, Bone Marrow and Erythropoiesis, Skin and Other Tissues	5
3.	Uptake, Retention and Metabolism of Androgens in Responsive Tissues	7
3.1.	"Highly Responsive" Tissues	7
3.2.	DHT Formation in Responsive Tissues	8
3.3.	Androgens in "Slightly Responsive" Tissues	9
4.	Androgen Receptors	10
4.1.	The Cytoplasmic Androgen Receptor	10
4.1.1.	Extraction	10
4.1.2.	Labeling	10
4.1.3.	Properties of the Cytoplasmic Androgen Receptor	11
4.1.4.	Physicochemical Parameters	12
4.1.5.	Interconversion of the 8—10 S and 3—5 S Forms of the Cytoplasmic Receptor by Salt	14
4.1.6.	Cellular Localization of the Cytoplasmic Receptor	14
4.1.7.	Isolation and Purification of the Cytoplasmic Androgen Receptor	14
4.2.	The Nuclear Androgen Receptor	15
4.2.1.	Labeling	15
4.2.2.	Isolation and Purification of Nuclei	15
4.2.3.	Extraction of the Nuclear Receptor	16
4.2.4.	Properties	16
4.2.5.	Discriminatory Features of the Nuclear and Cytoplasmic Androgen Receptor	17
4.2.6.	Origin of the Nuclear Androgen Receptor	17
4.3.	Hypotheses	19
5.	Androgen Receptor in Human Tissue	21
6.	Occurrence of Multiple Steroid Hormone Receptors in Target Organs	22
	References	23

II. Determination of Androgens by Competitive Protein-Binding Method and Radioimmunoassay. S. H. HASAN. With 10 Figures

1.	Competitive Protein-Binding Method	29
1.1.	Principle	29
1.2.	General Procedure for the Assay	31
1.3.	Preparation of Steroid-Binding Proteins	33
1.4.	Results	34
1.5.	Precision	34
1.6.	Specificity	34
1.7.	Sensitivity	37
2.	Radioimmunoassay	37
2.1.	Requirements for Radioimmunoassay	38
2.2.	Production of Antibodies	38
2.3.	Purification of the Antiserum with RIVANOL	39

2.4.	Titer	40
2.5.	Specificity	40
2.6.	Precision	41
2.7.	Sensitivity	41
2.8.	Methods	41
2.9.	Extraction of Unknown Sera	41
2.10.	Method of Purification	42
2.11.	Assay Procedure	42
2.12.	Calculations	43
	References	45

III. Nachweis und chemische Bestimmung von C_{19} -Steroiden (Androgenen).

G.W. OERTEL

1.	Biotest-Methoden	49
1.1.	Kapaunenkammtest	49
1.2.	Kükenkammtest	50
1.3.	Vesiculardrüsentest	50
2.	Chemische Bestimmungsmethoden	50
2.1.	Blut-Plasma	54
2.2.	Harn	63
	Literatur	75

IV. Biologische Auswertung der Androgene. H.E. Voss. Mit 27 Abbildungen

1.	Die Leydigzellen	81
2.	Der Einfluß der Zuführungsart auf die Wirksamkeit der Androgene	97
3.	Die Auswertung an Fischen	102
4.	Die Auswertung an Amphibien	109
5.	Die Auswertung an Reptilien	118
6.	Die Auswertung an Vögeln	121
6.1.	Der Test am Kapaunenkamm	123
6.2.	Der Test am Kükenkamm	131
7.	Die Auswertung an Säugetieren	137
7.1.	Der Test am Vas deferens	143
7.2.	Der Test an den Vesiculardrüsen („Samenblasen“) (Vdr)	144
7.3.	Der Test an der Prostata	160
7.4.	Der Test an den Präputialdrüsen	164
	Anhang: Der Fructose-Test	171
	Literatur	177

V. Klinik der Androgene. F. BAHNER. Unter Mitarbeit von I. VAINAS. Mit 4 Abbildungen

	Einleitung	187
1.	Die allgemeine Bedeutung der Androgene beim Menschen	187
2.	Die Androgene im Plasma	194
3.	Die Ausscheidung von Testosteron im Urin	205
4.	Produktionsraten der Androgene	207
5.	Pathologie der Androgene	215
5.1.	Hypogonadismus	215
5.2.	Gonadendysgenese	217
5.3.	Klinefelter-Syndrom	217
5.4.	Testikuläre Feminisierung	219
5.5.	Das adrenogenitale Syndrom (AGS)	220
5.6.	Das angeborene AGS	220
5.7.	Das Cushing-Syndrom	222
5.8.	Das AGS durch Tumoren	222
6.	Der Androgenüberschuß bei der Frau	223
	Literatur	226

VI. Antiandrogens. F. NEUMANN and H. STEINBECK. With 119 Figures

1.	Introduction	235
	References	237
2.	Action of Antiandrogens on Different Organs and Functions	238
2.1.	Accessory Sexual Glands, the Epididymis and Structure Activity Relationship	238
	References	270
2.1.1.	Epididymis	274
	References	278
2.2.	Neural-Gonadal Feedback System	278
	References	301
2.3.	Testicular Function	304
	References	329
2.4.	Puberty and Fertility	333
	References	343
2.5.	Libido and Aggressive Behavior	344
	References	350
2.6.	Morphologic Sexual Differentiation	351
	References	279
2.7.	Differentiation of Neural Centers	382
2.7.1.	Antiandrogenic Interference with the Development of Gonadotropin Secretion Patterns	382
2.7.2.	Influence of Antiandrogens on the Differentiation of Behavioral Patterns	388
2.7.3.	Biochemical Changes in the Brain Underlying the Influence of Antiandrogens during the Differentiation Period	396
	References	397
2.8.	Skin and its Adnexes	399
	References	406
2.9.	Bone Maturation and Longitudinal Growth	407
	References	414
2.10.	Effects in Female Animals	415
	References	421
2.11.	Other Activities of Antiandrogens on the Reproductive Tract in Male and Female Animals	422
2.11.1.	Progestational Activity of Antiandrogens	422
	References	422
2.11.2.	Androgenic Activity of Antiandrogens	423
	References	423
3.	Various Further Effects of Antiandrogens	424
3.1.	Influence of Cyproterone Acetate on Adrenal Function	424
	References	425
3.2.	Influence of Antiandrogens on Erythropoiesis	425
	References	426
3.3.	Influence on Steroid-Dependent Enzyme Induction in Microorganisms	426
	References	426
3.4.	Catatoxic Effects of Antiandrogens	426
	References	426
3.5.	Effect of Antiandrogens on the Plasmalogen Concentration in the Kidney [1]	426
	References	427
3.6.	Influence of Cyproterone Acetate on the Antler Growth Cycle [2]	427
	References	427
3.7.	Influence of Cyproterone Acetate on Hydroxylation of 5 α -Androstane-3,17-dione [1]	427
	References	427
3.8.	Influence of Cyproterone Acetate on Thyroid Radioiodine Uptake	427
	References	427
3.9.	Influence of Antiandrogenic Steroids on Some Metabolic Processes and Liver Function	428
	References	434
3.10.	Influence of an Antiandrogen on Sex-Specific Enzyme Distribution and Morphology in Non-Reproductive Organs	435
	References	435
3.11.	Antiandrogenic Antagonism Against the Sex-Odour of Boars	435
	References	436

4.	Methods of Testing Antiandrogens	436
4.1.	Antiandrogen Tests	437
	References	480

VII. Clinical Uses of Antiandrogens

(Other than for Hypersexuality and Sexual Deviations)

K.-J. GRÄF, J. BROTHERTON, and F. NEUMANN. With 13 Figures

1.	Introduction	485
1.1.	Structure and Bioassay	485
1.2.	Androgenic Diseases	487
1.3.	Effects of Lowering Plasma Androgens	488
1.4.	Properties of Antiandrogens in Man	489
1.4.1.	Antigonadotrophic Potency	489
1.4.2.	Progestogenic Properties	490
1.4.3.	Other Hormonal Properties	491
1.4.4.	Effect on Plasma Androgens	491
1.4.5.	Metabolic Effects	492
1.4.6.	Effect on the Testes	492
1.4.6.1.	Cyproterone Acetate	492
1.4.6.2.	Cyproterone	495
1.4.6.3.	Chlormadinone Acetate	495
1.4.6.4.	Amadinone	495
1.5.	Pharmacokinetics	496
1.5.1.	Cyproterone Acetate and Cyproterone	496
1.5.2.	Chlormadinone Acetate	497
1.6.	Metabolic Studies <i>in Vitro</i>	497
2.	Diseases of Prostate	500
2.1.	Introduction	500
2.2.	Treatment of Benign Prostate Hypertrophy	504
2.2.1.	Cyproterone Acetate	504
2.2.2.	Medrogestone	505
2.3.	Treatment of Prostatic Carcinoma	505
2.3.1.	Cyproterone Acetate	505
2.3.2.	Chlormadinone Acetate	508
3.	Dermatological Conditions	509
3.1.	Introduction	509
3.1.1.	The Role of Androgens in the Human Skin	509
3.1.2.	Effect of Antiandrogens on Serum and Urinary Androgens	510
3.1.3.	Effect of Antiandrogens on other Hormone Levels	510
3.2.	Hirsutism	511
3.2.1.	Androgen Levels and Metabolism	511
3.2.2.	Clinical Assessment	512
3.2.3.	Cyproterone	512
3.2.4.	Cyproterone Acetate	513
3.2.5.	Chlormadinone Acetate	516
3.2.6.	Benorterone	516
3.3.	Acne	517
3.3.1.	General	517
3.3.2.	Measurement of Sebum Production Rate	517
3.3.3.	Effects of Antiandrogens on the Sebaceous Glands	520
3.3.4.	Cyproterone	520
3.3.5.	Cyproterone Acetate	521
3.3.6.	Chlormadinone Acetate	522
3.3.7.	Benorterone	522
3.4.	Seborrhoea	522
3.4.1.	General	522
3.4.2.	Cyproterone and Cyproterone Acetate	523
3.4.3.	Benorterone	523
3.5.	Alopecia Androgenetica and Baldness	523
3.5.1.	General	523
3.5.2.	Cyproterone and Cyproterone Acetate	524
3.5.3.	Chlormadinone Acetate	524

4.	Precocious Puberty	524
4.1.	General	524
4.2.	Cyproterone	525
4.3.	Cyproterone Acetate	526
4.4.	Chlormadinone Acetate	530
5.	Control of Fertility	530
5.1.	Inhibition of Male Fertility	530
5.2.	Inhibition of Female Fertility	530
	References	532

VIII. Administration of Antiandrogens in Hypersexuality and Sexual Deviations.

H.J. HORN. With 4 Figures

1.1.	Androgens and Sexual Instinct	543
1.2.	Androgen Concentrations and Sexual Activity and Androgen Concentrations in Different Sexual Disturbances	543
2.	Inhibition of Sexuality in Men by Antiandrogens (Cyproterone Acetate)	545
2.1.	Clinical Results	545
2.2.	Effects of Therapy on Female Sexuality	548
2.3.	Psychic Effects of Therapy	548
2.4.	Results of Treatment by Diagnostic Criteria	551
2.5.	Hormonal Changes during Therapy With Cyproterone Acetate	554
2.6.	Changes in Ejaculate during Therapy With Cyproterone Acetate	555
2.7.	Changes in Spermogram during Therapy With Cyproterone Acetate	555
2.8.	Histological Changes in Testis during Therapy With Cyproterone Acetate . . .	557
2.9.	Laboratory Findings during Therapy With Cyproterone Acetate	560
	References	561

Author Index	563
Subject Index	603