

## AUSTRALIAN PRODUCT INFORMATION

# RECAGON™

## follitropin beta (RCH) Solution for Injection

### 1 NAME OF THE MEDICINE

Follitropin beta. [Recombinant human follicle-stimulating hormone (recFSH)]

### 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

One cartridge contains either 0.480 mL equal to a net dose of 300 IU follitropin beta (rch), 0.840 mL equal to a net dose of 600 IU follitropin beta (rch) or 1.230 mL equal to a net dose of 900 IU follitropin beta (rch).

Follitropin beta (rch) is produced by recombinant-DNA technology in a Chinese hamster ovary cell line transfected with the human FSH subunit genes.

For the full list of excipients, see **Section 6.1 List of Excipients**.

### 3 PHARMACEUTICAL FORM

Solution for injection.

Clear, colourless solution.

### 4 CLINICAL PARTICULARS

#### 4.1 THERAPEUTIC INDICATIONS

##### **In the female:**

Anovulatory infertility and;

Controlled ovarian hyperstimulation to induce the development of multiple follicles in medically assisted reproduction programs (e.g. *in vitro* fertilisation and related procedures).

##### **In the male:**

For the treatment of deficient spermatogenesis due to hypogonadotropic hypogonadism.

#### 4.2 DOSE AND METHOD OF ADMINISTRATION

Treatment with RECAGON should be initiated under the supervision of a physician experienced in the treatment of fertility problems.

##### **Dosage in the female:**

##### **Anovulation / defective follicle ripening and/or corpus luteum insufficiency**

There are great inter- and intra-individual variations in the response of the ovaries to exogenous gonadotrophins. This makes it impossible to set a uniform dosage scheme. The dosage should, therefore, be adjusted individually depending on the ovarian response. This requires ultrasound assessment of follicular development. The concurrent determination of serum oestradiol levels may also be useful.

A sequential treatment scheme is recommended starting with daily administration of 50 IU RECAGON. The starting dose is maintained for at least seven days. If there is no ovarian response, the daily dose is then gradually increased until follicle growth and/or plasma estradiol levels indicate an adequate pharmacodynamic response.

A daily ascent rate of 40-100 % is considered to be optimal. The daily effective dose is then maintained until pre-ovulatory conditions are reached. If oestrogen levels rise too rapidly, i.e. more than a daily doubling for 2 or 3 consecutive days, the daily dose should be decreased.

Pre-ovulatory conditions are reached when plasma oestradiol levels of 300-900 picogram/mL (1000-3000 pmol/L), or a total urinary oestrogen excretion of 75-200 microgram (250-650 nmol)/24 hours are attained, and/or when there is ultrasonographic evidence of a dominant follicle of at least 18 mm in diameter. The administration of RECAGON is then discontinued and ovulation can be induced by administering human chorionic gonadotrophin (hCG) in a dose of 5000-10000 IU. Two to three injections of 1000-3000 IU hCG each may be given within the following 9 days to prevent insufficiency of the corpus luteum.

Since follicles of over 15 mm may produce pregnancies, a maximum of two additional follicles exceeding 15 mm is acceptable. If this limit is exceeded, hCG should be withheld and pregnancy should be avoided in order to prevent large multiple gestations.

In women with polycystic ovarian disease, induction of a hypogonadotrophic state by a GnRH agonist before and during treatment with RECAGON may result in better pregnancy rates than without the use of an agonist.

### **Controlled ovarian hyperstimulation in medically assisted reproduction programs**

Various stimulation protocols are applied. A starting dose of 100-225 IU is recommended for at least the first four days. Thereafter, the dose may be adjusted individually, based on ovarian response. Stimulation of follicular growth is generally achieved by daily administration of 75-300 IU FSH. RECAGON can be given either alone, or in combination with clomiphene citrate to stimulate the endogenous production of gonadotrophins, or in combination with a GnRH agonist, in particular to prevent premature luteinization.

Maturation of follicles is monitored by ultrasound assessment. The concurrent determination of serum oestradiol levels may also be useful. When ultrasound assessment indicates the presence of at least three follicles of 16-20 mm, and there is evidence of a good oestradiol response (plasma levels of about 300-400 picogram/mL (1000-1300 pmol/L) for each follicle with a diameter greater than 18 mm), the final phase of maturation of the follicles is induced 30-40 hours after the last administration of RECAGON by administration of hCG in a dose of 5000-10000 IU oocyte retrieval is performed 34-35 hours later.

### **Dosage in the male:**

75 IU FSH injections are given daily or 2-3 times a week. These injections should be combined with a simultaneous dose of 1000-2000 IU hCG, 2-3 times a week to make up the necessary LH activity. This treatment should be continued for at least three months before any improvement in spermatogenesis can be expected. During this treatment testosterone replacement therapy should be suspended. Once achieved, the improvement may in some cases be maintained by hCG alone.

### **Paediatric population:**

There is no relevant indication for use of RECAGON in children.

### **Method of administration**

RECAGON solution for injection in cartridges has been developed for use in the PUREGON Pen and should be administered subcutaneously. The injection site should be alternated to prevent lipotrophy.

Using the pen, injection of RECAGON can be carried out by the patient or partner, provided proper instructions are given by the physician. Self-administration of RECAGON should only be performed by women who are well-motivated, adequately trained and with access to expert advice.

Do not use if the solution contains particles or if the solution is not clear. Each cartridge is for individual patient use only.

Empty cartridges must not be refilled. RECAGON cartridges are not designed to allow any other drug to be mixed in the cartridges.

### **4.3 CONTRAINDICATIONS**

- Hypersensitivity to the active substance or any of the excipients.
- Tumours of ovarium, breasts, uterus, testes, hypo-thalamus and pituitary gland.
- Pregnancy.
- Unexplained vaginal bleeding.
- Ovarian cysts or enlarged ovaries, not related to polycystic ovarian disease (PCOD).
- RECAGON is contraindicated when an effective response cannot be obtained, such as:
  - primary ovarian failure such as indicated by high levels of FSH.
  - organic disorders of the reproductive organs incompatible with pregnancy such as congenital malformations of the uterus and fibroids.
- Any condition in which a pregnancy (including multiple pregnancy) would be particularly hazardous (eg. extremes of weight disorders and uterine abnormalities).
- Primary testicular failure.
- RECAGON should not be used in the elderly or in children.

### **4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE**

- Before starting treatment, the couple's infertility should be assessed as appropriate. In particular, patients should be evaluated for hypothyroidism, adrenocortical insufficiency, hyperprolactinemia and pituitary or hypothalamic tumours, and appropriate specific treatment given.
- Prior to treating patients for inadequate gonadal function, the following should be assessed:
  - i. Careful clinical examination to determine general, pelvic or genital pathology.
  - ii. Serum gonadotrophin levels concentrations to exclude gonadal failure.
  - iii. Thyroid function, serum prolactin to exclude endocrinopathies that may be responsible.
  - iv. A semen analysis of the partner.
- Ovarian torsion has been reported after treatment with gonadotrophins, including RECAGON. Ovarian torsion may be associated with other risk factors such as Ovarian Hyperstimulation Syndrome (OHSS), pregnancy, previous abdominal surgery, past history of ovarian torsion, previous or current ovarian cyst and polycystic ovaries. Damage to the ovary due to reduced blood supply can be limited by early diagnosis and immediate detorsion.

- Multiple pregnancies and births have been reported for all gonadotrophin treatments, including RECAGON. Multiple gestations, especially high order, carry an increased risk of adverse maternal (pregnancy and delivery complications) and perinatal (low birth weight) outcomes. For anovulatory women undergoing ovulation induction, monitoring follicular development with transvaginal ultrasonography is important for minimising the risk of multi-foetal gestations. The concurrent determination of serum oestradiol levels may also be useful. The parents should be advised of the potential risks of multiple births before starting treatment.

In women undergoing Assisted Reproductive Technologies (ART) procedures, the risk of a multiple pregnancy is mainly related to the number of embryos transferred. When used for an ovulation induction cycle, appropriate FSH dose adjustment(s) should prevent multiple follicle development.

- The first injection of RECAGON should be performed under direct medical supervision.
- Infertile women undergoing ART, have an increased incidence of ectopic pregnancies. Early ultrasound confirmation that a pregnancy is intrauterine is therefore important.
- The incidence of congenital malformations after ART may be slightly higher than after spontaneous conceptions. This slightly higher incidence is thought to be related to differences in parental characteristics (e.g. maternal age, sperm characteristics) and to the higher incidence of multiple gestations after ART. Analysis of pooled data does not indicate that the use of gonadotrophins in ovulation induction and medically assisted reproduction programs carries an increased risk of congenital malformations.
- There have been reports of ovarian and other reproductive system neoplasms, both benign and malignant, in women who have undergone multiple drug regimens for infertility treatment. It is not established whether or not treatment with gonadotrophins increases the risk of these tumours in infertile women.
- RECAGON would not be expected to be effective in the absence of endogenous luteinising hormone (LH). The presence of spontaneous or progestogen withdrawal menstruation is suggestive of adequate endogenous LH.
- Thromboembolic events, both in association with and separate from OHSS, have been reported following treatment with gonadotrophins, including RECAGON. Intravascular thrombosis, which may originate in venous or arterial vessels, can result in reduced blood flow to vital organs or the extremities. In women with generally recognised risk factors for thromboembolic events, such as personal or family history, severe obesity or thrombophilia, treatment with gonadotrophins, including RECAGON, may further increase this risk. In these women the benefits of gonadotrophin administration, including RECAGON, need to be weighed against the risks. It should be noted however that pregnancy itself also carries an increased risk of thrombosis.
- RECAGON may contain traces of streptomycin and/or neomycin. These antibiotics may cause hypersensitivity reactions in susceptible persons.
- Elevated endogenous FSH levels in men are indicative of primary testicular failure. Such patients are unresponsive to RECAGON /hCG therapy.
- In men, semen analysis is recommended 4 to 6 months after the beginning of treatment in assessing the response.
- Medical conditions that contraindicate pregnancy should be evaluated before starting treatment with RECAGON.

## **Overstimulation of the Ovary during RECAGON therapy**

**Ovarian enlargement:** Mild to moderate uncomplicated ovarian enlargement which may be accompanied by abdominal distension and/or abdominal pain occurs in approximately 20% of those treated with RECAGON and hCG and generally regresses without treatment within two or three weeks.

In order to minimise the hazard associated with the occasional abnormal ovarian enlargement which may occur with RECAGON -hCG therapy, the lowest dose consistent with expectation of good results should be used. Careful monitoring of ovarian response can further minimise the risk of overstimulation.

If the ovaries are abnormally enlarged on the last day of RECAGON therapy, hCG should not be administered in this course of therapy; this will reduce the chances of development of the Ovarian Hyperstimulation Syndrome.

**The Ovarian Hyperstimulation Syndrome (OHSS):** OHSS is a medical event distinct from uncomplicated ovarian enlargement. OHSS may progress rapidly to become a serious medical event. It is characterised by an apparent dramatic increase in vascular permeability which can result in a rapid accumulation of fluid in the peritoneal cavity, thorax and potentially, the pericardium. Clinical signs and symptoms of mild and moderate OHSS are abdominal pain, nausea, diarrhoea, mild to moderate enlargement of ovaries and ovarian cysts. Severe OHSS may be life-threatening. Clinical signs and symptoms of severe OHSS are large ovarian cysts, acute abdominal pain, ascites, pleural effusion, hydrothorax, dyspnoea, oliguria, haematological abnormalities and weight gain. In rare instances, venous or arterial thromboembolism may occur in association with OHSS. Transient liver function test abnormalities suggestive of hepatic dysfunction with or without morphologic changes on liver biopsy have also been reported in association with OHSS. The early warning signs of development of OHSS are severe pelvic pain, nausea, vomiting and weight gain. The following symptomatology has been seen with cases of OHSS: abdominal pain, abdominal distension, gastrointestinal symptoms including nausea, vomiting and diarrhoea, severe ovarian enlargement, weight gain, dyspnoea and oliguria. Clinical evaluation may reveal hypovolaemia, haemo-concentration, electrolyte imbalances, ascites, haemoperitoneum, pleural effusions, hydrothorax, acute pulmonary distress and thromboembolic events (see **Pulmonary and Vascular Complication**).

OHSS may be caused by administration of human chorionic gonadotrophin (hCG) and by pregnancy (endogenous hCG). Early OHSS usually occurs within 10 days after hCG administration and may be associated with an excessive ovarian response to gonadotrophin stimulation. Late OHSS occurs more than 10 days after hCG administration, as a consequence of the hormonal changes with pregnancy. Because of the risk of developing OHSS, patients should be monitored for at least two weeks after hCG administration. OHSS occurs uncommonly in patients when the recommended dose is administered and is more common in patients when higher than recommended doses are administered. Cases of OHSS are more common, more severe and more protracted if pregnancy occurs. Most often, OHSS occurs after treatment has been discontinued and reaches its maximum at about seven to ten days following treatment. Usually, OHSS resolves spontaneously with the onset of menses. If there is evidence that OHSS may be developing prior to hCG administration, the hCG should be withheld.

Women with known risk factors for a high ovarian response may be especially prone to the development of OHSS during or following treatment with RECAGON. For women having their first cycle of ovarian stimulation, for whom risk factors are only partially known, close observation for early signs and symptoms of OHSS is recommended.

Follow current clinical practice for reducing the risk of OHSS during Assisted Reproductive Technology (ART). Adherence to the recommended RECAgon dose and treatment regimen and careful monitoring of ovarian response is important to reduce the risk of OHSS. To monitor the risk of OHSS, ultrasound assessments of follicular development should be performed prior to treatment and at regular intervals during treatment; the concurrent determination of serum oestradiol levels may also be useful. In ART there is an increased risk of OHSS with 18 or more follicles of 11 mm or more in diameter.

If OHSS develops, standard and appropriate management of OHSS should be implemented and followed.

If OHSS occurs, treatment should be stopped and the patient hospitalised. Treatment is primarily symptomatic, consisting of bed rest, fluid and electrolyte management and analgesics if needed. The phenomenon of haemoconcentration associated with fluid loss into the peritoneal cavity, pleural cavity and the pericardial cavity has been seen to occur and should be thoroughly assessed in the following manner: 1) fluid intake and output, 2) weight, 3) haematocrit, 4) serum and urinary electrolytes, 5) urine specific gravity, 6) BUN and creatinine, and 7) abdominal girth. These determinations are to be performed daily or more often if the need arises.

With OHSS there is an increased risk of injury to the ovary. The ascitic, pleural and pericardial fluid should not be removed unless absolutely necessary to relieve symptoms such as pulmonary distress or cardiac tamponade. Pelvic examination may cause rupture of an ovarian cyst, which may result in haemoperitoneum, and should therefore be avoided. If this does occur, and if bleeding becomes such that surgery is required, the surgical treatment should be designed to control bleeding and to retain as much ovarian tissue as possible. Intercourse should be prohibited in those patients in whom significant ovarian enlargement occurs after ovulation because of the danger of haemoperitoneum resulting from ruptured ovarian cysts.

The management of OHSS may be divided into three phases: an acute, a chronic and a resolution phase. Because the use of diuretics can accentuate the diminished intravascular volume, diuretics should be avoided except in the late phase of resolution as described below.

*Acute Phase:* Management during the acute phase should be designed to prevent haemoconcentration due to loss of intravascular volume to the third space and to minimise the risk of thromboembolic phenomena and kidney damage. Treatment is designed to normalise electrolytes while maintaining an acceptable but somewhat reduced intra vascular volume. Full correction of the intravascular volume deficit may lead to an unacceptable increase in the amount of third space fluid accumulation. Management includes administration of limited intravenous fluids, electrolytes, and human serum albumin.

Monitoring for the development of hyperkalaemia is recommended.

*Chronic Phase:* After stabilising the patient during the acute phase, excessive fluid accumulation in the third space should be limited by instituting severe potassium, sodium and fluid restriction.

*Resolution Phase:* A fall in haematocrit and an increasing urinary output without an increased intake are observed due to the return of third space fluid to the intravascular compartment. Peripheral and/or pulmonary oedema may result if the kidneys are unable to excrete third space fluid as rapidly as it is mobilised. Diuretics may be indicated during the resolution phase if necessary to combat pulmonary oedema.

### **Pulmonary and vascular complication**

Serious pulmonary conditions (e.g. atelectasis, acute respiratory distress syndrome) have been reported. In addition, thromboembolic events both in association with, and separate from

the Ovarian Hyperstimulation Syndrome are possible following RECAGON therapy. Intravascular thrombosis, which may originate in venous or arterial vessels, can result in reduced blood flow to vital organs or the extremities. Sequelae of such events have included venous thrombophlebitis, pulmonary embolism, pulmonary infarction, cerebral vascular occlusion (Stroke) and arterial occlusion resulting in loss of limb. In rare cases, pulmonary complications and/or thromboembolic events could result in death.

### **Multiple births**

In the majority of patients, the pregnancies following treatment with RECAGON resulted in single births. For patients undergoing IVF treatment the risk of multiple pregnancy following assisted reproductive technologies is related to the number of oocytes/ embryos replaced, in other patients the incidence of multiple pregnancies is increased by RECAGON, as with other agents used to stimulate ovulation. However, the majority of multiple conceptions are twins.

Pregnancy loss is higher than that in the normal population, but comparable with the rates found in women with other fertility problems.

### **Use in the elderly**

See Section 4.3 Contraindications.

### **Paediatric use**

See Section 4.3 Contraindications.

### **Effects on laboratory tests**

There are no known effects on laboratory tests.

## **4.5 INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS**

Concurrent use of RECAGON and clomiphene may enhance the follicular response. After pituitary desensitisation effected by a GnRH agonist, a higher dose of RECAGON may be necessary to elicit an adequate follicular response.

## **4.6 FERTILITY, PREGNANCY AND LACTATION**

### **Effects on fertility**

See **Section 4.1 Therapeutic Indications**.

### **Use in pregnancy**

Category B2: Follitropin beta is not intended for use during pregnancy (see **Section 4.3 Contraindications**). There are no available data from studies in which RECAGON was administered to pregnant animals. In case of inadvertent exposure during pregnancy, clinical data are not sufficient to exclude a teratogenic effect of recombinant FSH.

### **Use in lactation**

There is no information available from clinical or animal studies on the excretion of follitropin beta in milk. It is unlikely that follitropin beta is excreted in human milk due to its high molecular weight. If follitropin beta would be excreted in human milk, it is likely to be degraded in the gastrointestinal tract of the child. However, there are no data available demonstrating this. Follitropin beta may affect milk production.

#### 4.7 EFFECTS ON ABILITY TO DRIVE AND USE MACHINES

As far as known this medicine has no influence on alertness and powers of concentration.

#### 4.8 ADVERSE EFFECTS (UNDESIRABLE EFFECTS)

**Unwanted ovarian hyperstimulation, ovarian hyperstimulation syndrome:** Signs and symptoms of ovarian hyperstimulation syndrome were reported in 3% of women treated with RECAGON in clinical trials.

**Multiple pregnancy (including higher order multiplets than twins).**

**Table 1: Body System Disorders**

Percentages of patients with at least one adverse experience classified by body system and reported as related to study drug pre-marketing in clinical trials (1)		
Body system (WHO system-organ class)	RECAGON n = 1074	Metrodin (Urinary FSH) n = 498
	%	%
Gastro-intestinal system disorders		
Nausea	0.5	0.8
Abdominal Pain	0.1	0
Other	3.0	3.4
Reproductive disorders, female (2)		
Hyperstimulation Syndrome	5.2	4.0
Ectopic Pregnancy	2.2	3.4
Abdominal Pain	3.0	3.2
Vaginal Haemorrhage	1.1	0.3
Foetal disorders		
Miscarriage	3.1	4.2
Body as a whole-general disorders		
Pain	0.5	0.2
Influenza-like symptoms	0.2	0.2
Swollen Abdomen	0.2	0
Other	0.3	0.6
Application site disorders		
Injection Site Pain	1.0	0.6

(1) a subject can have adverse experiences in more than one body system.

(2) for this category the number of female patients is used.

#### **Application Site Disorders:**

Bruising\*, pain, redness, swelling, itching.

(\*in one study of 195 women undergoing superovulation for IVF, comparing intramuscular and subcutaneous routes of administration no differences between the two routes of administration were significant apart from bruising which was more common in the subcutaneous group).

Generalised hypersensitivity reactions which may include erythema, urticaria, rash and pruritus have been observed uncommonly.



**In the Female:**

The table below lists the adverse reactions with RECAGON reported in clinical trials in females according to system organ class and frequency; common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ).

**Table 2**

<b>SOC</b>	<b>Frequency</b>	<b>Adverse reaction</b>
Nervous system disorders	Common	Headache
Gastrointestinal disorders	Common	Abdominal distension Abdominal pain
	Uncommon	Abdominal discomfort Constipation Diarrhoea Nausea
Reproductive system and breast disorders	Common	OHSS <sup>1</sup> Pelvic pain
	Uncommon	Breast Complaints <sup>2</sup> Metrorrhagia Ovarian cyst Ovarian enlargement Ovarian torsion <sup>3</sup> Uterine enlargement Vaginal haemorrhage
General disorders and administration site conditions	Common	Injection site reaction <sup>4</sup>
	Uncommon	Generalised hypersensitivity reaction <sup>5</sup>

1. Characteristic symptoms of ovarian hyperstimulation and the ovarian hyperstimulation syndrome are included under **Section 4.4 Special Warnings and Precautions for Use**.

2. Breast complaints include tenderness, pain and/or engorgement and nipple pain

3. See also **Section 4.4 Special Warnings and Precautions for Use**

4. Local reactions at the site of injection include: bruising, pain, redness, swelling and itching

5. Generalised hypersensitivity reaction include erythema, urticaria, rash and pruritus

In rare instances, thromboembolism has been associated with RECAGON/hCG treatment as with other gonadotrophins.

**In the Male:**

The table below lists the adverse reactions with RECAGON reported in a clinical trial in males (30 patients dosed) according to system organ class and frequency; common ( $\geq 1/100$  to  $< 1/10$ ).

**Table 3**

<b>SOC</b>	<b>Frequency<sup>1</sup></b>	<b>Adverse reaction</b>
Nervous system disorders	Common	Headache
Skin and subcutaneous tissue disorders	Common	Acne Rash
Reproductive system and breast disorders	Common	Epididymal cyst Gynecomastia
General disorders and administration site conditions	Common	Injection site induration

1. Adverse reactions that are reported only once are listed as common because a single report raises the frequency above 1%.

### **Reporting suspected adverse effects**

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at [www.tga.gov.au/reporting-problems](http://www.tga.gov.au/reporting-problems).

## **4.9 OVERDOSE**

No data on acute toxicity of RECAGON in humans is available, but the acute toxicity of RECAGON and of urinary gonadotrophin preparations in animal studies has been shown to be very low. Too high a dosage for more than one day may lead to hyperstimulation of the ovaries (see Unwanted Hyperstimulation, under **Section 4.4 Special Warnings and Precautions for Use**).

For information on the management of overdose, contact the Poisons Information Centre on 131126 (Australia).

## **5 PHARMACOLOGICAL PROPERTIES**

### **5.1 PHARMACODYNAMIC PROPERTIES**

Pharmacotherapeutic group: gonadotropins; ATC code: G03GA06.

#### **Mechanism of action**

RECAGON contains follitropin beta, a recombinant human FSH. FSH is indispensable in normal gamete growth and maturation, and gonadal steroid production.

**In the female:** The amount of FSH is critical for the onset and duration of follicular development, and consequently for the timing and number of follicles reaching maturity. RECAGON can thus be used to stimulate follicular development and steroid production in selected cases of disturbed gonadal function.

Furthermore, RECAGON can be used to promote multiple follicular development in medically assisted reproduction programs [e.g. *in vitro* fertilisation/embryo transfer (IVF/ET), gamete or zygote intra-fallopian transfer (GIFT/ZIFT)].

In the absence of an endogenous LH surge, treatment with RECAGON is generally followed by administration of hCG to induce the final phase of follicle maturation, leading to ovulation.

**In the male:** In deficient spermatogenesis due to hypogonadotropic hypogonadism, RECAGON is given to substitute FSH for the stimulation of the Sertoli cells. The high LH activity needed to stimulate the Leydig cells is provided by an hCG preparation given in addition.

#### **Clinical trials**

Not included in this package insert.

### **5.2 PHARMACOKINETIC PROPERTIES**

#### **Absorption**

After subcutaneous administration of RECAGON, high concentrations of follitropin beta are reached within about 12 hours. Due to the sustained release from the injection site, and the

relatively long elimination half-life of about 40 hours (ranging from 12 to 70 hours), follitropin beta levels remain high for 24-48 hours.

### **Distribution, metabolism, and excretion**

Due to the relatively long elimination half-life, after repeated administration, plasma concentrations of follitropin beta are approximately 1.5-2.5 times higher than after single administration. This increase contributes to reach therapeutic follitropin beta FSH concentrations.

Since follitropin beta [recombinant FSH] is very similar to endogenous FSH, it is expected that it would be distributed, metabolised, and excreted in the same way.

### **Bioequivalence Study**

A bioequivalence study was performed to compare the pharmacokinetics of FSH after subcutaneous single-dose injection of RECAGON with a conventional syringe as dissolved freeze-dried cake (2 x 75 IU) versus administration of RECAGON solution (150 IU) with pen-injector.

Due to the precision of the device, it can be assumed that exactly 150 IU was injected with the Pen-injector. The dose injected with the syringe was actually lower than the anticipated 150 IU, which is due to losses while filling the syringe and/or removing excess air and to the void volume of the syringe. After correction of the dose by a factor of 1.18, bioequivalence was demonstrated for all relevant pharmacokinetic parameters (see Table below). Since the daily dose of RECAGON is determined by the patient's individual ovarian response, the slightly higher dose delivered by the Pen is unlikely to affect clinical outcome. The following table shows the main pharmacokinetic results of the study:

**Table 4**

<b>Parameter</b>	<b>Pen injector (n=20)</b>	<b>Syringe (n=20)</b>	<b>Point estimate</b>	<b>90% CI</b>	<b>Outcome</b>
<b>AUC<sub>0-∞</sub> IU/L.h</b>	215.1	220.3	1.01	0.93-1.10	bioequivalent
<b>Cmax (IU/L)</b>	3.36	3.43	1.00	0.91-1.11	bioequivalent
<b>Cl app (L/h/kg)</b>	0.0117	0.0122	0.99	0.91-1.08	bioequivalent

## **5.3 PRECLINICAL SAFETY DATA**

### **Genotoxicity**

Follitropin beta showed no genotoxic activity in a series of assays performed to evaluate its potential to cause gene mutations (*Salmonella typhimurium* and *E. coli*) and chromosomal damage (human lymphocytes *in vitro*).

### **Carcinogenicity**

Long-term studies in animals have not been performed to evaluate the carcinogenic potential of follitropin beta.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 LIST OF EXCIPIENTS**

sucrose  
sodium citrate dihydrate  
methionine  
polysorbate 20  
benzyl alcohol  
water for injections  
sodium hydroxide (for pH adjustment)  
hydrochloric acid (for pH adjustment)

### **6.2 INCOMPATIBILITIES**

No relevant incompatibilities are known.

### **6.3 SHELF LIFE**

The expiry date can be found on the packaging. In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG).

### **6.4 SPECIAL PRECAUTIONS FOR STORAGE**

Protect from light.

Pharmacy - store at 2°C to 8°C (refrigerate, do not freeze) until expiry date on carton.

Patient - store at 2°C to 8°C (refrigerate, do not freeze) until expiry date on carton, or alternatively store below 25°C for a maximum of 3 months within the shelf life.

The product should not be kept above 25°C, refrigerate if necessary.

After commencement of use, RECAGON may be stored below 25°C (do not freeze) for a maximum of 28 days.

### **6.5 NATURE AND CONTENTS OF CONTAINER**

RECAGON solution for injection is available in a clear, glass cartridge with rubber stopper, rubber inlay and aluminium crimp cap.

Pack size: 1 Cartridge/Carton.

**RECAGON 300IU/0.36mL** solution for injection. AUST R No. 393991

**RECAGON 600IU/0.72mL**. solution for injection. AUST R No. 393992

**RECAGON 900IU/1.08mL** solution for injection. AUST R No. 393993

## 6.6 SPECIAL PRECAUTIONS FOR DISPOSAL

In Australia, any unused medicine or waste material should be disposed of by taking to your local pharmacy.

## 6.7 PHYSICOCHEMICAL PROPERTIES

### Chemical structure

No data available.

### CAS number

146479-72-3

## 7 MEDICINE SCHEDULE (POISONS STANDARD)

Prescription Only Medicine (S4)

## 8 SPONSOR

Organon Pharma Pty Ltd  
Building A, 26 Talavera Road  
Macquarie Park NSW 2113

## 9 DATE OF FIRST APPROVAL

28 October 2022

## 10 DATE OF REVISION

### SUMMARY TABLE OF CHANGES

Section Changed	Summary of new information
All	Create PI for additional trade name