

## Data Sheet

# LETRACCORD

### *Letrozole*

### *2.5 mg tablets*

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## Presentation

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LETRACCORD is a yellow, round biconvex film-coated tablet, plain on both sides containing 2.5 mg of letrozole.

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## Clinical particulars

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### *Therapeutic indications*

- Adjuvant treatment of postmenopausal women with hormone receptor positive early breast cancer.
- Extended adjuvant treatment of early breast cancer in postmenopausal women who have received  $\geq 4.5$  and  $\leq 6.0$  years prior standard adjuvant tamoxifen therapy.
- First-line treatment in postmenopausal women with advanced breast cancer.
- Treatment of advanced breast cancer in women with natural or artificially induced postmenopausal status, who have previously been treated with anti-oestrogens.

### *Dosage and method of administration*

#### **Adult and elderly patients**

The recommended dose of LETRACCORD tablets is 2.5 mg once daily. In the adjuvant and extended adjuvant setting, treatment with LETRACCORD tablets should continue for 5 years or until tumour relapse occurs, whichever comes first. In patients with metastatic disease, treatment with LETRACCORD tablets should continue until tumour progression is evident. No dose adjustment is required for elderly patients.

#### **Children**

Not applicable.

### **Patients with hepatic and/or renal impairment**

No dosage adjustment is required for patients with mild hepatic impairment or renal impairment (creatinine clearance  $\geq 30$  mL/min.). Insufficient data are available to justify a dose advice in cases of renal insufficiency with a creatinine clearance less than 30 mL/min or in patients with severe hepatic insufficiency. Patients with severe hepatic impairment (Child-Pugh score C) should be kept under close supervision (see Pharmacokinetic properties).

### **Contraindications**

- Known hypersensitivity to the active substance or to any of the excipients.
- Premenopausal endocrine status; pregnancy, lactation (see Pregnancy and lactation and Preclinical safety data).

### **Special warnings and precautions for use**

#### **Renal impairment**

Letrozole has not been investigated in patients with creatinine clearance  $< 10$  mL/min nor in a sufficient number of patients with a creatinine clearance less than 30 mL/min. The potential risk/benefit to such patients should be carefully considered before administration of LETRACCORD tablets. As letrozole is weakly bound to plasma proteins (see Pharmacokinetic properties), it is anticipated that it could be removed from circulation by dialysis. Similar caution should be exercised in patients with severe hepatic insufficiency.

#### **Hepatic impairment**

In patients with severe hepatic cirrhosis impairment (Child-Pugh score C), systemic exposure and terminal half-life were approximately doubled compared to healthy volunteers. Such patients should therefore be kept under close supervision (see Pharmacokinetic properties).

#### **Bone effects**

Osteoporosis and/or bone fractures have been reported with the use of letrozole. Therefore monitoring of overall bone health is recommended during treatment (see Adverse effects).

### **Interaction with other medicinal products and other forms of interaction**

Clinical interaction studies with cimetidine and warfarin indicated that the co-administration of letrozole with these drugs does not result in clinically significant drug interactions.

A review of the clinical trial database indicated no evidence of other clinically relevant interaction with other commonly prescribed drugs.

There is no clinical experience to date on the use of letrozole in combination with other anti-cancer agents.

Letrozole inhibits *in vitro* the cytochrome P<sub>450</sub>-isozymes 2A6, and moderately 2C19. CYP2A6 does not play a major role in drug metabolism. In *in vitro* experiments, letrozole was not able to substantially inhibit the metabolism of diazepam (a substrate of CYP2C19) at concentrations approximately 100-fold higher than those observed in plasma at steady state. Thus, clinically relevant interactions with CYP2C19 are unlikely to occur. However, caution should be used in the concomitant administration of drugs whose disposition is mainly dependent on these isoenzymes and whose therapeutic index is narrow.

### ***Pregnancy and lactation***

#### **Pregnancy**

LETRACCORD tablets are contraindicated during pregnancy (see Contraindications and Preclinical safety data).

#### **Women of child-bearing potential**

The physician needs to discuss the necessity of adequate contraception with women who have the potential to become pregnant including women who are perimenopausal or who recently became postmenopausal, until their postmenopausal status is fully established (see Preclinical safety data).

#### **Lactation**

LETRACCORD tablets are contraindicated during lactation (see Contraindications).

### ***Effects on ability to drive and use machines***

Since fatigue and dizziness have been observed with the use of letrozole and somnolence has been reported uncommonly, caution is advised when driving or using machines.

### ***Adverse effects***

Letrozole has been generally well tolerated across all studies as first-line and second-line treatment for advanced breast cancer, as adjuvant treatment of early breast cancer and as extended adjuvant treatment in women who have received prior standard tamoxifen therapy. Approximately one third of the patients treated with letrozole in the metastatic and neo-adjuvant settings, approximately 70 to 75% of the patients in the adjuvant setting (both letrozole and tamoxifen arms), and approximately 40% of the patients in the extended adjuvant setting (both letrozole and placebo arms) experienced adverse

reactions. Generally, the observed adverse reactions are mainly mild or moderate in nature, and most are associated with oestrogen deprivation.

The most frequently reported adverse reactions in the clinical studies were hot flushes, arthralgia, nausea and fatigue. Many adverse reactions can be attributed to the normal pharmacological consequences of oestrogen deprivation (e.g. hot flushes, alopecia and vaginal bleeding). The following adverse drug reactions, listed in Table 1, were reported from clinical studies and from post marketing experience with letrozole.

In the adjuvant settings there was a *significant difference* in incidence of osteoporosis and bone fractures in patients who received LETRACCORD compared to patients who received tamoxifen (osteoporosis 2.0% vs 1.1%, P=0.001 and bone fractures 6.4% vs 4.8%, P=0.003 at any time after randomization, respectively).

In the extended adjuvant setting there was a higher but non significant incidence of osteoporosis and bone fractures in patients who received LETRACCORD than in patients who received placebo (6.9% vs 5.5% and 5.9% vs 5.5% respectively) (see Pharmacodynamic properties - Extended adjuvant treatment)

**Table 1**

Adverse reactions are ranked under headings of frequency, the most frequent first, using the following convention: very common ( $\geq 1/10$ ); common ( $\geq 1/100$ ,  $< 1/10$ ); uncommon ( $\geq 1/1000$ ,  $< 1/100$ ); rare ( $\geq 1/10,000$ ,  $< 1/1000$ ); very rare ( $< 1/10,000$ ), including isolated report.

<b>Infections and infestations</b>	
Uncommon	Urinary tract infection
<b>Neoplasms benign, malignant and unspecified (including cysts and polyps)</b>	
Uncommon	Tumour pain <sup>6</sup>
<b>Blood and the lymphatic system disorders</b>	
Uncommon	Leukopenia
<b>Metabolism and nutrition disorders</b>	
Common	Anorexia, appetite increase, hypercholesterolemia
Uncommon	General oedema
<b>Psychiatric disorders</b>	
Common	Depression
Uncommon	Anxiety <sup>1</sup>

<b>Nervous system disorders</b>	
Common	Headache, dizziness
Uncommon	Somnolence, insomnia, memory impairment, dysaesthesia <sup>2</sup> , taste disturbance, cerebrovascular accident
<b>Eye disorders</b>	
Uncommon	Cataract, eye irritation, blurred vision
<b>Cardiac disorders</b>	
Uncommon	Palpitations, tachycardia
<b>Vascular disorders</b>	
Uncommon	Thrombophlebitis <sup>3</sup> , hypertension, ischemic cardiac events <sup>7</sup>
Rare	Pulmonary embolism, arterial thrombosis, cerebrovascular infarction
<b>Respiratory, thoracic and mediastinal disorders</b>	
Uncommon	Dyspnoea, cough
<b>Gastrointestinal disorders</b>	
Common	Nausea, vomiting, dyspepsia, constipation, diarrhoea
Uncommon	Abdominal pain, stomatitis, dry mouth
<b>Hepatobiliary disorders</b>	
Uncommon	Increased hepatic enzymes
Very rare	Hepatitis
<b>Skin and subcutaneous tissue disorders</b>	
Common	Alopecia, increased sweating, rash <sup>4</sup>
Uncommon	Pruritus, dry skin, urticaria
Very rare:	Angioedema, anaphylactic reaction, toxic epidermal necrolysis, erythema multiforme
<b>Musculoskeletal and connective tissue disorders</b>	
Very common	Arthralgia
Common	Myalgia, bone pain, osteoporosis, bone fractures
Uncommon	Arthritis
<b>Renal and urinary disorders</b>	
Uncommon	Increased urinary frequency

<b>Reproductive system and breast disorders</b> Uncommon	Vaginal bleeding, vaginal discharge, vaginal dryness, breast pain
<b>General disorders and administration site conditions</b> Very common Common Uncommon	Hot flushes Fatigue <sup>5</sup> , peripheral oedema Pyrexia, mucosal dryness, thirst
<b>Investigations</b> Common Uncommon	Weight increase Weight loss

1. *including nervousness, irritability*
2. *including paraesthesia, hypoaesthesia*
3. *including superficial and deep thrombophlebitis*
4. *including erythematous, maculopapular, psoriaform and vesicular rash*
5. *including asthenia and malaise*
6. *in metastatic/neoadjuvant setting only*
7. *in the adjuvant setting, irrespective of causality, the following adverse events occurred in the letrozole and tamoxifen groups respectively: thromboembolic events (1.2% vs. 2.8%), angina pectoris (0.7% vs. 0.6%), myocardial infarction (0.6% vs. 0.4%) and cardiac failure (0.9% vs. 0.4%).*

## **Overdose**

Isolated cases of overdosage with letrozole have been reported.

No specific treatment for overdosage is known; treatment should be symptomatic and supportive.

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## **Pharmacological properties**

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### ***Pharmacodynamic properties***

Pharmacotherapeutic group: Non-steroidal aromatase inhibitor (inhibitor of oestrogen biosynthesis); antineoplastic agent (ATC code L02B G04).

## Pharmacodynamic effects

The elimination of oestrogen-mediated stimulatory effects is a prerequisite for tumour response in cases where the growth of tumour tissue depends on the presence of oestrogens. In postmenopausal women, oestrogens are mainly derived from the action of the aromatase enzyme, which converts adrenal androgens - primarily androstenedione and testosterone - to oestrone (E1) and oestradiol (E2). The suppression of oestrogen biosynthesis in peripheral tissues and the cancer tissue itself can therefore be achieved by specifically inhibiting the aromatase enzyme.

Letrozole is a non-steroidal aromatase inhibitor. It inhibits the aromatase enzyme by competitively binding to the haem of the cytochrome P<sub>450</sub> subunit of the enzyme, resulting in a reduction of oestrogen biosynthesis in all tissues.

In healthy postmenopausal women, single doses of 0.1 mg, 0.5 mg and 2.5 mg letrozole suppress serum oestrone and oestradiol by 75 to 78% and 78% from baseline, respectively. Maximum suppression is achieved in 48 to 78 hours.

In postmenopausal patients with advanced breast cancer, daily doses of 0.1 to 5 mg suppress plasma concentration of oestradiol, oestrone, and oestrone sulphate by 75 to 95% from baseline in all patients treated. With doses of 0.5 mg and higher, many values of oestrone and oestrone sulphate are below the limit of detection in the assays, indicating that higher oestrogen suppression is achieved with these doses. Oestrogen suppression was maintained throughout treatment in all these patients.

Letrozole is highly specific in inhibiting aromatase activity. Impairment of adrenal steroidogenesis has not been observed. No clinically relevant changes were found in the plasma concentrations of cortisol, aldosterone, 11-deoxycortisol, 17-hydroxy-progesterone, and ACTH, or in plasma renin activity among postmenopausal patients treated with a daily dose of letrozole 0.1 to 5 mg. The ACTH stimulation test performed after 6 and 12 weeks of treatment with daily doses of 0.1 mg, 0.25 mg, 0.5 mg, 1 mg, 2.5 mg and 5 mg did not indicate any attenuation of aldosterone or cortisol production. Thus, glucocorticoid and mineralocorticoid supplementation is not necessary.

No changes were noted in plasma concentrations of androgens (androstenedione and testosterone) among healthy postmenopausal women after 0.1 mg, 0.5 mg and 2.5 mg single doses of letrozole or in plasma concentrations of androstenedione among postmenopausal patients treated with daily doses of 0.1 to 5 mg, indicating that the blockade of oestrogen biosynthesis does not lead to accumulation of androgenic precursors. Plasma levels of LH and FSH are not affected by letrozole in patients, nor is thyroid function as evaluated by TSH, T4 and T3 uptake.

## Adjuvant treatment

A multicenter, double-blind study randomized over 8,000 postmenopausal women with resected receptor-positive early breast cancer, to one of the following arms:

- A. tamoxifen for 5 years
- B. letrozole for 5 years
- C. tamoxifen for 2 years followed by letrozole for 3 years
- D. letrozole for 2 years followed by tamoxifen for 3 years

Data in Table 2 reflect results from non-switching arms (arms A and B) together with data truncated 30 days after the switch in the two switching arms (arms C and D). The analysis of monotherapy vs sequencing of endocrine treatments will be conducted when the necessary number of events has been achieved.

Patients have been followed for a median of 26 months, 76% of the patients for more than 2 years, and 16% (1,252 patients) for 5 years or longer.

The primary endpoint of the trial was disease-free survival (DFS) which was assessed as the time from randomization to the earliest event of loco-regional or distant recurrence (metastases) of the primary disease, development of invasive contra-lateral breast cancer, appearance of a second non-breast primary tumour or death from any cause. Letrozole reduced the risk of recurrence by 19% compared with tamoxifen (hazard ratio 0.81;  $P=0.003$ ), corresponding to a reduction of the absolute risk by 2.6% at 5 years. The 5-year DFS rates were 84.0% for letrozole and 81.4% for tamoxifen. The improvement in DFS with letrozole is seen as early as 12 months and is maintained beyond 5 years. Letrozole also significantly reduced the risk of recurrence compared with tamoxifen whether prior adjuvant chemotherapy was given (hazard ratio 0.72;  $P=0.018$ ) or not (hazard ratio 0.84;  $P=0.044$ ).

For the secondary endpoint overall survival a total of 358 deaths were reported (166 on letrozole and 192 on tamoxifen). There was no significant difference between treatments in overall survival (hazard ratio 0.86;  $P=0.15$ ). Distant disease-free survival (distant metastases), a surrogate for overall survival, differed significantly overall (hazard ratio 0.73;  $P=0.001$ ) and in pre-specified stratification subsets. Letrozole significantly reduced the risk of systemic failure by 17% compared with tamoxifen (hazard ratio 0.83;  $P=0.02$ ), and reduced the risk of invasive contra-lateral breast cancer by almost 40% but due to the relatively low power of so few events, this result was not statistically significant. Patients receiving letrozole, compared to tamoxifen, had fewer second malignancies (1.9% vs 2.4%). Particularly the incidence of endometrial cancer was lower with letrozole compared to tamoxifen (0.2% vs 0.4%).

See Tables 2 and 3 that summarize the results:

**Table 2 Disease-free and overall survival (ITT population)**

	Letrozole N=4003	Tamoxifen N=4007	Hazard Ratio (95 % CI)	P-Value <sup>1</sup>
<b>Disease-free survival (primary)</b>				
- events (protocol definition, total)	351	428	0.81 (0.70, 0.93)	0.0030
<b>Distant disease-free survival (metastases) (secondary)</b>	184	249	0.73 (0.60, 0.88)	0.0012
<b>Overall survival (secondary)</b>				
- number of deaths (total)	166	192	0.86 (0.70, 1.06)	0.1546
<b>Systemic disease-free survival (secondary)</b>	323	383	0.83 (0.72, 0.97)	0.0172
<b>Contra-lateral breast cancer (invasive) (secondary)</b>	19	31	0.61 (0.35, 1.08)	0.0910

CI = confidence interval

<sup>1</sup> Log rank test, stratified by randomization option and use of prior adjuvant chemotherapy

**Table 3 Disease-free and overall survival by nodal status and prior adjuvant chemotherapy (ITT population)**

	Hazard Ratio, 95% CI for hazard ratio	P-Value <sup>1</sup>
<b>Disease-free survival</b>		
<b>Nodal status</b>		
- Positive	0.71 (0.59, 0.85)	0.0002
- Negative	0.72 (0.55, 0.95)	0.8875
<b>Prior adjuvant chemotherapy</b>		
- Yes	0.72 (0.55, 0.95)	0.0178
- No	0.84 (0.71, 1.00)	0.0435
<b>Overall survival</b>		
<b>Nodal status</b>		
- Positive	0.81 (0.63, 1.05)	0.1127
- Negative	0.88 (0.59, 1.30)	0.5070
<b>Prior adjuvant chemotherapy</b>		
- Yes	0.76 (0.51, 1.14)	0.1848
- No	0.90 (0.71, 1.15)	0.3951
<b>Distant disease-free survival</b>		
<b>Nodal status</b>		
- Positive	0.67 (0.54, 0.84)	0.0005
- Negative	0.90 (0.60, 1.34)	0.5973
<b>Prior adjuvant chemotherapy</b>		
- Yes	0.69 (0.50, 0.95)	0.0242
- No	0.75 (0.60, 0.95)	0.0184

CI = confidence interval

<sup>1</sup> Cox model significance level**Extended adjuvant treatment**

In a multicenter, double-blind, randomized, placebo-controlled study, performed in over 5,100 postmenopausal patients with receptor-positive or unknown primary breast cancer patients who had remained disease-free after completion of adjuvant treatment with tamoxifen (4.5 to 6 years) were randomly assigned either letrozole or placebo.

The primary analysis conducted at a median follow-up of around 28 months (25% of the patients being followed-up for up to 38 months) showed that

letrozole reduced the risk of recurrence by 42% compared with placebo (hazard ratio 0.58;  $P=0.00003$ ). Sensitivity analysis confirmed the robustness of the data. The statistically significant benefit in DFS in favour of letrozole was observed regardless of nodal status - node negative, hazard ratio 0.48,  $P=0.002$ ; node positive, hazard ratio 0.61,  $P=0.002$ .

For the secondary endpoint overall survival (OS) a total 113 deaths were reported (51 letrozole, 62 placebo). Overall, there was no significant difference between treatments in OS (hazard ratio 0.82;  $P=0.29$ ). In node positive disease, letrozole significantly reduced the risk of mortality by approximately 40 % (hazard ratio 0.61;  $P=0.035$ ), whereas no significant difference was seen in node negative patients (hazard ratio 1.36;  $P=0.385$ ), in patient with prior chemotherapy and in patients with no prior chemotherapy. See Tables 4 and 5 that summarize the results:

**Table 4 Disease-free and overall survival (Modified ITT population)**

	<b>Letrozole N=2582</b>	<b>Placebo N=2586</b>	<b>Hazard Ratio (95 % CI)</b>	<b>P-Value</b>
<b>Disease-free survival</b> (primary)				
- events (protocol definition, total)	92 (3.6%)	155 (6.0%)	0.58 (0.45, 0.76) <sup>1</sup>	0.00003
<b>Distant disease-free survival</b>	57	93	0.61 (0.44, 0.84) <sup>2</sup>	0.003
<b>Overall survival</b> (secondary)				
- number of deaths (total)	51	62	0.82 (0.56, 1.19) <sup>1</sup>	0.291
<b>Contra-lateral breast cancer</b> (secondary)				
- including DCIS/LCIS (total)	19	30	0.63 (0.36, 1.13) <sup>3</sup>	0.120
- invasive (total)	15	25	0.60 (0.31, 1.14) <sup>3</sup>	0.117

CI = confidence interval

DCIS = ductal carcinoma in situ

LCIS = lobular carcinoma in situ

1. Stratified by receptor status, nodal status and prior adjuvant chemotherapy
2. Non-stratified analysis
3. Odds ratio, stratified analysis

**Table 5 Disease-free and overall survival by receptor status, nodal status and previous chemotherapy (Modified ITT population)**

	Hazard Ratio, 95% CI for disease free survival		P-Value
<b>Disease-free survival</b>			
<b>Receptor status</b>			
- Receptor positive	0.57	(0.44, 0.75)	0.00003
<b>Nodal status</b>			
- Negative	0.48	(0.30, 0.78)	0.00239
- Positive	0.61	(0.44, 0.83)	0.00168
<b>Chemotherapy</b>			
- None	0.58	(0.40, 0.84)	0.00330
- Received	0.59	(0.41, 0.84)	0.00322
<b>Overall survival</b>			
<b>Nodal status</b>			
- Negative	1.36	(0.68, 2.71)	0.385
- Positive	0.61	(0.38, 0.97)	0.035

CI = confidence interval

There was no difference in safety and efficacy between patients aged <65 versus  $\geq 65$  years.

Updated analyses were conducted at a median follow-up of 49 months. In the letrozole arm at least 30% of the patients had completed 5 years and 59% had completed at least 4 years of follow-up. After the unblinding of the study, 56% of the patients in the placebo arm opted to switch to letrozole (i.e. late extended adjuvant population).

In this analysis of DFS, letrozole significantly reduced the risk of breast cancer recurrence compared with placebo (HR 0.68; 95% CI 0.55, 0.83;  $P=0.0001$ ). Letrozole also significantly reduced the odds of a new invasive contra-lateral breast cancer by 41% compared with placebo (OR 0.59; 95% CI 0.36, 0.96;  $P=0.03$ ). There was no significant difference in distant disease-free survival or overall survival.

The clinical interpretation of these updated analyses should take into account that over half of the patients in the placebo arm switched to letrozole. Therefore, analyses were conducted to evaluate the effect of the switch. In one exploratory analysis comparing letrozole with placebo until switch, Letrozole reduced the risk of breast cancer recurrence (HR 0.55; 95% CI 0.45, 0.68). After unblinding, patients who switched to letrozole from placebo had been off adjuvant tamoxifen for a median 31 months (range 14 to 79 months). Other analyses were performed within the placebo arm taking account of the switch to letrozole. Acknowledging the varying times of the switch after the completion of prior tamoxifen therapy and the known limitations of non-randomized comparison, results suggested a consistent reduction in the risk of breast cancer recurrence in those patients who switched to letrozole (HR 0.31; 95% CI 0.20, 0.49).

The following adverse events irrespective of causality were reported significantly more often with letrozole than with placebo - hot flushes (60.3% vs. 52.6%), arthralgia/arthritis (37.9% vs. 26.8%) and myalgia (15.8% vs. 8.9%). The majority of these adverse events were observed during the first year of treatment. In the patients in the placebo arm who switched to letrozole, a similar pattern of general adverse events was observed. The incidence of self-reported osteoporosis, any time after randomization, was higher in patients who received letrozole than for placebo (12.3% vs. 7.4%). The incidence of clinical fractures, any time after randomization, was higher in patients who received letrozole than for placebo (10.9% vs. 7.2%). In patients who switched to letrozole, newly diagnosed osteoporosis, any time after switching, was reported in 3.6% of patients while fractures were reported in 5.1% of patients any time after switching.

Updated results (median follow-up was 40 months) from the bone mineral density (BMD) sub-study demonstrated that, at 2 years, compared to baseline, patients receiving letrozole had a median decrease of 3.8% in hip BMD compared to 2.0 % in the placebo group ( $P=0.018$ ). There was no significant difference in changes in lumbar spine BMD at any time. Updated results (median follow-up was approximately 50 months) from the lipid sub-study showed no significant difference between the letrozole and placebo groups at any time. In the core study the incidence of cardiovascular ischemic events for letrozole versus placebo until switch was 11.1% vs. 8.6%.

### **First-line treatment**

One well-controlled double-blind trial was conducted comparing letrozole 2.5 mg to tamoxifen as first-line therapy in postmenopausal women with locally advanced or metastatic breast cancer. In 907 women, results were statistically significant in favour of letrozole compared with tamoxifen in time to progression (primary endpoint) and in overall objective response, time to treatment failure and clinical benefit. Specific results are presented in Table 6.

**Table 6 Results at a median follow-up of 32 months**

	<b>Letrozole</b>	<b>Tamoxifen</b>	<b>P-value</b>
Time to progression (median)	9.4 months	6.0 months	<0.0001
Overall objective tumour response (rate)	32%	21%	0.0002
Duration of overall objective tumour response (median)	25 months	23 months	0.0578
Time to treatment failure (median)	9.1 months	5.7 months	<0.0001
Clinical benefit (rate)	50%	38%	0.0004

Both time to progression and objective response rate were significantly longer/higher for letrozole than for tamoxifen irrespective of receptor status (Table 7).

**Table 7 Receptor status**

	<b>Letrozole</b>	<b>Tamoxifen</b>	<b>P-value</b>
<b>Receptor Status: ER and/or PgR+:</b>			
Time to progression (median)	9.4 months	6.0 months	<0.0001
Overall objective tumour response (rate)	33%	22%	0.0019
<b>Unknown/negative:</b>			
Time to progression (median)	9.2 months	6.0 months	0.0402
Overall objective tumour response (rate)	30%	20%	0.0309
ER: oestrogen receptor PgR: progesterone receptor			

The efficacy by dominant disease site is described in Table 8:

**Table 8 Efficacy by dominant disease site**

<b>Dominant disease site</b>	<b>Letrozole n=453</b>	<b>Tamoxifen n=454</b>	<b>P-value</b>
<b>Soft tissue:</b>	n=113	n=115	
Time to progression (median)	12.1 months	6.4 months	0.0456
Overall objective tumour response	50%	34%	0.0171
<b>Bone:</b>	n=145	n=131	
Time to progression (median)	9.5 months	6.2 months	0.0262
Overall objective tumour response	23%	15%	0.0891
<b>Viscera:</b>	n=195	n=208	
Time to progression (median)	8.3 months	4.6 months	0.0005
Overall objective tumour response	28%	17%	0.0095
<b>Liver metastasis:</b>	n=60	n=55	
Time to progression (median)	3.8 months	3.0 months	0.0232
Overall objective tumour response	10%	11%	0.8735
Rate of overall clinical benefit	28%	16%	0.1292
Overall survival (median) (including crossover)	19 months	12 months	0.0727

Note: "Liver metastasis" is a subset of patients with dominant site of disease in viscera.

Study design allowed patients to crossover upon progression to the other therapy or discontinue from the study. Approximately 50% of patients crossed over to the opposite treatment arm and crossover was virtually completed by 36 months. The median time to crossover was 17 months (LETRACCORD to tamoxifen) and 13 months (tamoxifen to LETRACCORD). LETRACCORD treatment in the first line therapy of advanced breast cancer patients is associated with an early survival advantage over tamoxifen. The median

survival was 34 months for LETRACCORD and 30 months for tamoxifen. A significantly greater number of patients were alive on LETRACCORD versus tamoxifen throughout the first 24 months of the study (repeated log rank test), see Table 9.

**Table 9 Overall survival - Patients alive, died, crossed treatments**

Months	Letrozole (n=458)			Tamoxifen (n=458)			Log rank
	Alive	Deaths	Crossed to tamoxifen	Alive	Deaths	Crossed to letrozole	P-value
6	426	31	51	406	52	74	0.0167
12	378	79	129	343	114	145	0.0038
18	341	115	185	297	159	179	0.0010
24	286	166	208	263	193	198	0.0246
30	241	209	225	227	227	217	0.0826
36	156	243	233	169	251	224	0.2237
42	70	267	238	85	266	226	0.4820
48	24	277		27	272	228	0.6413
54	6	277		6	276		*0.5303

\* Overall log rank test *P*-value.

The treatment effects analysed by the covariate "prior adjuvant antioestrogen therapy" are detailed in Table 10.

**Table 10 Results according to prior adjuvant antioestrogen therapy**

Endpoint	Prior hormone therapy			No prior hormone therapy		
	Letrozole n=84	Tamoxifen n=83	P-value	LETRACCOR D n=369	Tamoxifen n=371	P-value
Time to progression (median)	8.9 months	5.9 months	0.0033	9.5 months	6.0 months	0.0003
Overall objective tumour response	26%	8%	0.0038	33%	24%	0.0039
Clinical benefit	46%	31%	0.0464	51%	40%	0.0026
	<b>n=86</b>	<b>n=83</b>		<b>n=372</b>	<b>n=375</b>	
Overall survival (median) including crossover	28 months	30 months	0.6558	34 months	30 months	0.3756
	<b>n=45</b>	<b>n=43</b>		<b>n=174</b>	<b>n=186</b>	
Survival first-line (patients who did not crossover) (median)	33 months	18 months		33 months	19 months	

In patients who did not crossover to the opposite treatment arm, median survival was 35 months with letrozole (n=219, 95% CI 29 to 43 months) vs. 20 months with tamoxifen (n=229, 95% CI 16 to 26 months).

The total duration of endocrine therapy (time to chemotherapy) was significantly longer for letrozole (median 16.3 months, 95% CI 15 to 18 months) than for tamoxifen (median 9.3 months, 95% CI 8 to 12 months) (log rank  $P=0.0047$ ).

Worsening of Karnofsky Performance Score (KPS) by 20 points or more occurred in significantly fewer patients on letrozole first-line (19%) than tamoxifen first-line (25%) (odds ratio,  $P=0.0208$ ).

### Second-line treatment

Two well-controlled clinical trials were conducted, comparing two letrozole doses (LETRACCOR 0.5 mg and 2.5 mg) to megestrol acetate and to

aminoglutethimide, respectively, in postmenopausal women with advanced breast cancer previously treated with anti-oestrogens.

Statistically significant differences were observed in favour of letrozole 2.5 mg compared with megestrol acetate in overall objective tumour response rate (24% vs. 16%,  $P=0.04$ ), and in time to treatment failure ( $P=0.04$ ). Time to progression was not significantly different between letrozole 2.5 mg and megestrol acetate ( $P=0.07$ ). Overall survival was not significantly different between the 2 arms ( $P=0.2$ ).

In the second study, letrozole 2.5 mg was statistically superior to aminoglutethimide for time to progression ( $P=0.008$ ), time to treatment failure ( $P=0.003$ ), and overall survival ( $P=0.002$ ). The response rate was not significantly different between letrozole 2.5 mg and aminoglutethimide ( $P=0.06$ ).

## ***Pharmacokinetic properties***

### **Absorption**

Letrozole is rapidly and completely absorbed from the gastrointestinal tract (mean absolute bioavailability: 99.9%). Food slightly decreases the rate of absorption (median  $t_{max}$ : 1 hour fasted versus 2 hours fed; and mean  $C_{max}$ :  $129 \pm 20.3$  nmol/L fasted versus  $98.7 \pm 18.6$  nmol/L fed), but the extent of absorption (AUC) is not changed. The minor effect on the absorption rate is not considered to be of clinical relevance, and therefore letrozole may be taken without regard to meal times.

### **Distribution**

Plasma protein binding of letrozole is approximately 60%, mainly to albumin (55%). The concentration of letrozole in erythrocytes is about 80% of that in plasma. After administration of 2.5 mg  $^{14}C$ -labelled letrozole, approximately 82% of the radioactivity in plasma was unchanged compound. Systemic exposure to metabolites is therefore low. Letrozole is rapidly and extensively distributed to tissues. Its apparent volume of distribution at steady state is about  $1.87 \pm 0.47$  L/kg.

### **Metabolism and elimination**

Metabolic clearance to a pharmacologically inactive carbinol metabolite is the major elimination pathway of letrozole ( $CL_m = 2.1$  L/h), but is relatively slow when compared to hepatic blood flow (about 90 L/h). The cytochrome  $P_{450}$  isoenzymes 3A4 and 2A6 were found to be capable of converting letrozole to this metabolite. Formation of minor unidentified metabolites, and direct renal and faecal excretion play only a minor role in the overall elimination of letrozole. Within 2 weeks after administration of 2.5 mg  $^{14}C$ -labelled letrozole to healthy postmenopausal volunteers,  $88.2 \pm 7.6$  % of the radioactivity was recovered in urine and  $3.8 \pm 0.9$  % in faeces. At least 75% of the radioactivity recovered in urine up to 216 hours ( $84.7 \pm 7.8$  % of the dose) was attributed to

the glucuronide of the carbinol metabolite, about 9% to two unidentified metabolites, and 6% to unchanged letrozole.

The apparent terminal elimination half-life in plasma is about 2 days. After daily administration of 2.5 mg, steady-state levels are reached within 2 to 6 weeks. Plasma concentrations at steady state are approximately 7 times higher than concentrations measured after a single dose of 2.5 mg, while they are 1.5 to 2 times higher than the steady-state values predicted from the concentrations measured after a single dose, indicating a slight non-linearity in the pharmacokinetics of letrozole upon daily administration of 2.5 mg. Since steady-state levels are maintained over time, it can be concluded that no continuous accumulation of letrozole occurs.

Age had no effect on the pharmacokinetics of letrozole.

### **Special populations**

In a study involving volunteers with varying degrees of renal function (24-hour creatinine clearance 9 to 116 mL/min), no effect on the pharmacokinetics of letrozole was found after a single dose of 2.5 mg. In a similar study involving subjects with varying degrees of hepatic function, the mean AUC values of the volunteers with moderate hepatic impairment (Child-Pugh score B) was 37% higher than in normal subjects, but still within the range seen in subjects without impaired function. In a study comparing the pharmacokinetics of letrozole after a single oral dose in eight subjects with liver cirrhosis and severe hepatic impairment (Child-Pugh score C) to those in healthy volunteers (n=8), AUC and  $t_{1/2}$  increased by 95 and 187%, respectively. Breast-cancer patients with severe hepatic impairment are thus expected to be exposed to higher levels of letrozole than patients without severe hepatic dysfunction. However, since in patients dosed at 5 or 10 mg/day no increase in toxicity was observed, a dose reduction in patients with severe hepatic impairment appears not to be warranted, although such patients should be kept under close supervision. In addition, in two well-controlled studies involving 359 patients with advanced breast cancer, no effect of renal impairment (calculated creatinine clearance: 20 to 50 mL/min) or hepatic dysfunction was found on the letrozole concentration.

### ***Preclinical safety data***

In a variety of preclinical safety studies conducted in standard animal species, there was no evidence of systemic or target organ toxicity.

Letrozole showed a low degree of acute toxicity in rodents exposed to up to 2,000 mg/kg. In dogs, letrozole caused signs of moderate toxicity at 100 mg/kg.

In repeated-dose toxicity studies in rats and dogs up to 12 months, the main findings observed can be attributed to the pharmacological action of the compound. The no-adverse effect level was 0.3 mg/kg in both species.

Both *in vitro* and *in vivo* investigations on letrozole's mutagenic potential revealed no indications of any genotoxicity.

In a 104-week rat carcinogenicity study, no treatment-related tumours were noted in male rats. In female rats, a reduced incidence of benign and malignant mammary tumours at all the doses of letrozole was found.

Oral administration of letrozole to gravid rats resulted in a slight increase in the incidence of fetal malformation among the animals treated. However, it was not possible to show whether this was an indirect consequence of the pharmacological properties (inhibition of oestrogen biosynthesis), or a direct effect of letrozole in its own right (see recommendations in sections Contraindications and Pregnancy and lactation).

Preclinical observations were confined to those associated with the recognised pharmacological action, which is the only safety concern for human use derived from animal studies.

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## **Pharmaceutical particulars**

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### ***List of excipients***

Lactose monohydrate, maize starch, hypromellose, microcrystalline cellulose, sodium starch glycolate, silica colloidal anhydrous, magnesium stearate, Opadry 03B82927 (Hypromellose 6 cp E464, Titanium dioxide E171, iron oxide yellow E172, macrogol 400, talc E553b)

### ***Incompatibilities***

Not applicable.

### ***Shelf life***

3 years.

### ***Special precautions for storage***

Store below 25°C

LETRACCORD Tablets should be kept out of the reach and sight of children.

### ***Nature and contents of container***

Blister packs containing 30 tablets

### ***Instructions for use/handling***

No specific instructions for use/handling.

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## **Medicine classification**

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Prescription Medicine

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## **Name and address**

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Distributed in New Zealand by:

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Remuera  
Auckland  
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Fax: +64 9 630-4490

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## **Date of preparation**

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1 July 2009