



This medicinal product is subject to additional monitoring in Australia. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse events at <https://www.tga.gov.au/reporting-problems>.

## AUSTRALIAN PRODUCT INFORMATION – WELIREG<sup>®</sup> (BELZUTIFAN) TABLETS

### 1 NAME OF THE MEDICINE

Belzutifan

### 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each WELIREG tablet contains 40 mg of belzutifan.

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

### 3 PHARMACEUTICAL FORM

WELIREG 40 mg tablet is a blue oval shaped, film-coated tablet debossed with “177” on one side and plain on the other side.

### 4 CLINICAL PARTICULARS

#### 4.1 THERAPEUTIC INDICATIONS

WELIREG (belzutifan) is indicated for the treatment of adult patients with von Hippel-Lindau (VHL) disease who require therapy for associated renal cell carcinoma (RCC), central nervous system (CNS) haemangioblastomas, or pancreatic neuroendocrine tumours (pNET), not requiring immediate surgery.

#### 4.2 DOSE AND METHOD OF ADMINISTRATION

The recommended dose of WELIREG is 120 mg (three 40 mg tablets) administered orally once daily, with or without food. Swallow tablets whole.

If a dose of WELIREG is missed, it can be taken as soon as possible on the same day. Resume the regular daily dose schedule for WELIREG the next day. Extra tablets should not be taken to make up for the missed dose. If vomiting occurs any time after taking WELIREG, do not retake the dose. The next dose should be taken the next day. Treatment should continue until disease progression or unacceptable toxicity occurs.

#### ***Dose Modifications***

Dosage modifications for WELIREG for adverse reactions are summarised in **Table 1**.

**Table 1: Recommended Dose Modifications**

Adverse Reactions	Severity*	Dose Modification
	Grade 3 <sup>†</sup>	• Withhold until resolved to ≤ Grade 2.

Anaemia due to decreased erythropoietin (see <b>Section 4.4 Special Warnings and Precautions for Use</b> )		<ul style="list-style-type: none"> <li>Resume at a reduced dose (reduce by 40 mg) or discontinue depending on the severity and persistence of anemia.</li> </ul>
	Grade 4 <sup>‡</sup>	<ul style="list-style-type: none"> <li>Withhold until resolved to ≤ Grade 2.</li> <li>Resume at a reduced dose (reduce by 40 mg) or permanently discontinue upon recurrence of Grade 4.</li> </ul>
Hypoxia (see <b>Section 4.4 Special Warnings and Precautions for Use</b> )	Grade 3 <sup>§</sup> (asymptomatic)	<ul style="list-style-type: none"> <li>Option to continue or withhold until resolved to ≤ Grade 2.</li> <li>Resume at reduced dose (reduce by 40 mg) or discontinue depending on the severity and persistence of hypoxia.</li> </ul>
	Grade 3 <sup>§</sup> (symptomatic)	<ul style="list-style-type: none"> <li>Withhold until resolved to ≤ Grade 2.</li> <li>Resume at reduced dose (reduce by 40 mg) or discontinue depending on the severity and persistence of hypoxia.</li> </ul>
	Grade 4 <sup>¶</sup>	<ul style="list-style-type: none"> <li>Permanently discontinue.</li> </ul>

\* Based on National Cancer Institute Common Terminology Criteria for Adverse Events (NCI CTCAE), version 4.0

<sup>†</sup> Anaemia Grade 3: Hgb <8.0 g/dL; <4.9 mmol/L; <80 g/L; transfusion indicated

<sup>‡</sup> Anaemia Grade 4: Life-threatening consequences; urgent intervention indicated

<sup>§</sup> Hypoxia Grade 3: Decreased oxygen saturation at rest (e.g., pulse oximeter <88% or PaO<sub>2</sub> ≤55 mm Hg)

<sup>¶</sup> Hypoxia Grade 4: Life-threatening airway compromise; urgent intervention indicated (e.g., tracheotomy or intubation)

If a patient experiences a Grade 3 adverse reaction, not addressed in **Table 1**, withhold dosing until symptoms improve to ≤ Grade 2, then consider resuming at a reduced dose (reduce by 40 mg). Permanently discontinue WELIREG if Grade 3 adverse reaction recurs (see **Section 4.8 Adverse Effects (Undesirable Effects)**). If a patient experiences a Grade 4 adverse reaction, not previously addressed in **Table 1**, permanently discontinue WELIREG (see **Section 4.8 Adverse Effects (Undesirable Effects)**).

### ***Paediatric Patients***

Safety and efficacy of WELIREG have not been established in paediatric patients less than 18 years of age (see **Section 4.4 Special Warnings and Precautions for Use** and **Section 5.2 Pharmacokinetic Properties**).

### ***Geriatric Patients***

There are limited data available on the use of WELIREG in patients aged 65 years and over. There is no evidence that elderly patients require a different dose than younger adult patients (see **Section 4.4 Special Warnings and Precautions for Use** and **Section 5.2 Pharmacokinetic Properties**). No dose adjustment of WELIREG is recommended in elderly patients.

### ***Renal Impairment***

No dose adjustment of WELIREG is recommended in patients with mild and moderate renal impairment. WELIREG has not been studied in patients with severe renal impairment (see **Section 4.4 Special Warnings and Precautions for Use** and **Section 5.2 Pharmacokinetic Properties**).

### ***Hepatic Impairment***

No dose adjustment of WELIREG is recommended in patients with mild hepatic impairment. WELIREG has not been studied in patients with moderate or severe hepatic impairment (see

**Section 4.4 Special Warnings and Precautions for Use and Section 5.2 Pharmacokinetic Properties).**

### **4.3 CONTRAINDICATIONS**

None

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

#### ***Anaemia due to Decreased Erythropoietin***

WELIREG can cause severe anaemia that can require blood transfusion

In a clinical trial (Study-004) with WELIREG for the treatment of patients with VHL disease-associated RCC, anaemia was reported in 55 patients (90.2%). Grade 3 anaemia occurred in 6 patients (9.8%) (see **Section 4.8 Adverse Effects (Undesirable Effects)**). Median time to onset of all Grade anaemia events was 30 days (range: 1 day to 8.38 months). Of the 13 patients that were treated with an erythropoiesis-stimulating agent (ESA), 4 received treatment with both an ESA and blood transfusions, while 9 received treatment with an ESA alone. Patients received an ESA based on haemoglobin levels and physician discretion (See **Section 5.1 Pharmacodynamic properties**). In another clinical trial (Study-001) for the treatment of non-VHL disease-associated advanced solid tumours using the same dose of WELIREG, anaemia was reported in 44 patients (75.9%). Grade 3 anaemia occurred in 16 patients (27.6%).

Monitor for anaemia before initiation of and periodically throughout treatment with WELIREG. Closely monitor patients who are dual UGT2B17 and CYP2C19 poor metabolisers due to potential increases in exposure that may increase the incidence or severity of anaemia. For patients who develop Grade 3 anaemia, withhold WELIREG and treat according to standard medical practice, until resolved to  $\leq$  Grade 2. For recurrent Grade 3 anaemia, discontinue WELIREG. For patients who develop Grade 4 anaemia, withhold WELIREG and permanently discontinue for recurrent Grade 4 anaemia (See **Section 4.2 Dose and Method of Administration**).

#### ***Hypoxia***

WELIREG can cause severe hypoxia that may require discontinuation, supplemental oxygen, or hospitalisation.

In a clinical trial (Study-004) with WELIREG for the treatment of patients with VHL disease-associated RCC, Grade 3 hypoxia occurred in 1 patient (1.6%) (see **Section 4.8 Adverse Effects (Undesirable Effects)**). In another clinical trial (Study-001) for the treatment of non-VHL disease-associated advanced solid tumours using the same dose of WELIREG, hypoxia occurred in 17 patients (29.3%), Grade 3 hypoxia occurred in 9 patients (15.5%).

Monitor oxygen saturation with pulse oximetry before initiation of and periodically throughout treatment with WELIREG. For Grade 3 asymptomatic hypoxia (e.g., pulse oximetry  $<88\%$  or  $P_aO_2 \leq 55$  mm Hg at rest), consider providing supplemental oxygen and consider continuing or withholding treatment. If withheld, resume at a reduced dose. For patients who have Grade 3 symptomatic hypoxia (e.g., pulse oximetry  $<88\%$  or  $P_aO_2 \leq 55$  mm Hg at rest), withhold WELIREG, treat hypoxia, and consider dose reduction. If symptomatic hypoxia continues to

recur, discontinue treatment. For Grade 4 hypoxia (life-threatening airway compromise; urgent intervention indicated e.g., tracheotomy or intubation), permanently discontinue treatment (See **Section 4.2 Dose and Method of Administration**).

Advise patients to report signs and symptoms of hypoxia immediately to a healthcare provider.

### ***Embryo-Fetal Toxicity***

Based on findings in animals, WELIREG may cause fetal harm, including fetal loss, in humans. In a rat study, belzutifan caused embryo-fetal toxicity when administered during the period of organogenesis at maternal exposures that were lower than the human exposures at the recommended dose of 120 mg daily. Advise females of reproductive potential to use effective non-hormonal contraceptive during treatment with WELIREG and for 1 week after the last dose due to the potential risk to the fetus. This is because the use of WELIREG may reduce the efficacy of hormonal contraceptives. Advise male patients with female partners of reproductive potential to use highly effective contraception during treatment with WELIREG and for 1 week after the last dose (See **Section 4.5 Interactions with other medicines and other forms of interactions** and **Section 4.6 Fertility, pregnancy and lactation**).

### ***Dual UGT2B17 and CYP2C19 Poor Metabolisers***

Patients who are dual UGT2B17 and CYP2C19 poor metabolisers have higher belzutifan exposures, which may increase the incidence and severity of adverse reactions of belzutifan and should be closely monitored (See **Section 4.8 Adverse Effects (Undesirable Effects)**, and **Section 5.1 Pharmacodynamic properties**).

### ***Use in hepatic impairment***

No dose adjustment of WELIREG is recommended in patients with mild hepatic impairment. WELIREG has not been studied in patients with moderate or severe hepatic impairment (See **Section 4.2 Dose and Method of Administration** and **Section 5.2 Pharmacokinetic Properties**).

### ***Use in renal impairment***

No dose adjustment of WELIREG is recommended in patients with mild or moderate renal impairment. WELIREG has not been studied in patients with severe renal impairment (See **Section 4.2 Dose and Method of Administration** and **Section 5.2 Pharmacokinetic Properties**).

### ***Use in the elderly***

No dosage adjustment of WELIREG is recommended in geriatric patients. Clinical trials of WELIREG did not include sufficient numbers of patients aged 65 years and over to determine whether there is a difference in safety or effectiveness compared to younger patients (See **Section 5.1 Pharmacodynamic properties, Clinical Trials** and **Section 5.2 Pharmacokinetic Properties**). Of the 61 patients with VHL disease-associated RCC (Study-004) treated with WELIREG, only 2 patients were 65 years and over. Another clinical trial

(Study-001) for the treatment of non-VHL disease-associated advanced solid tumours included 24 patients were 65 years and over.

### ***Paediatric use***

Safety and effectiveness of WELIREG in paediatric patients under 18 years of age have not been established.

### ***Effects on laboratory tests***

No data available.

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

In vitro and pharmacogenomic studies indicate that belzutifan is metabolised by UGT2B17 and by CYP2C19.

### ***Effects of WELIREG on Other Drugs***

*In vitro* studies have shown that belzutifan induces CYP3A4.

Coadministration of WELIREG with CYP3A4 substrates, including hormonal contraceptives, decreases concentrations of CYP3A substrates, which may reduce the efficacy of these substrates. The magnitude of this decrease may be more pronounced in patients who are dual UGT2B17 and CYP2C19 poor metabolisers (See **Section 5.1 Pharmacodynamic properties, Clinical Trials** and **Section 5.2 Pharmacokinetic Properties**).

Coadministration of WELIREG with hormonal contraceptives may lead to contraceptive failure or an increase in breakthrough bleeding.

Belzutifan inhibits MATE2K (IC<sub>50</sub> 0.7 µM), OCT1 (IC<sub>50</sub> 47 µM) and MATE1 (IC<sub>50</sub> 39 µM) *in vitro* while the clinical unbound C<sub>max</sub> is 1.8 µM. WELIREG might increase plasma exposures of co-administered drugs that are predominantly cleared by these transporters.

### ***Effects of Other Drugs on WELIREG***

Co-administration with inhibitors of UGT2B17 or CYP2C19 is expected to increase plasma belzutifan exposure. Dose adjustment is not required on co-administration with inhibitors of UGT2B17 or CYP2C19. Drugs that induce CYP2C19 are expected to reduce plasma exposures of belzutifan.

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

### ***Effects on fertility***

No fertility studies in animals were conducted. Testicular atrophy and hypospermia, associated with decreased sperm count and motility and abnormal sperm morphology, were observed in general toxicology studies in rats at exposures lower than the human exposure at the recommended dose of 120 mg daily, and did not reverse at the end of a 26-week recovery period. Belzutifan caused post implantation loss in pregnant rats at exposures lower than the

human exposure at the recommended dose of 120 mg daily. Based on findings in animals, WELIREG may impair fertility in males and females of reproductive potential. Advise patients of this potential risk.

### ***Use in pregnancy – Pregnancy Category D***

Based on findings in animal studies, WELIREG may cause fetal harm, including fetal loss, when administered to a pregnant woman. There are no available data on the use of WELIREG in pregnant women to evaluate drug-associated risk. In a rat embryo-fetal development study, administration of belzutifan during organogenesis caused embryo-fetal lethality, reduced fetal body weight, and fetal skeletal abnormalities at exposures similar to or below the human exposure at the recommended dose of 120 mg daily. Advise females of reproductive potential of the potential risk to a fetus.

### ***Use in lactation***

There are no data on the presence of belzutifan or its metabolites in human milk, their effects on the breastfed child, or on milk production. Because of the potential for serious adverse reactions in breastfed children, advise women not to breastfeed during treatment with WELIREG and for 1 week after the last dose.

## ***Females and Males of Reproductive Potential***

### **Pregnancy Testing**

Verify the pregnancy status of females of reproductive potential prior to initiating treatment with WELIREG.

### **Contraception**

WELIREG may cause embryo-fetal harm, including fetal loss, when administered to a pregnant woman (See **Section 4.6 Fertility, pregnancy and lactation, Use in pregnancy**).

#### ***Females***

Advise females of reproductive potential to use highly effective contraception during treatment with WELIREG and for at least 1 week after the last dose. Use of WELIREG may reduce the efficacy of hormonal contraceptives. Advise patients using hormonal contraceptives to use an alternative non-hormonal contraceptive method or add a barrier method of contraception (e.g. male condom) during treatment with WELIREG (See **Section 4.5 Interactions with other medicines and other forms of interactions**).

#### ***Males***

Advise male patients with female partners of reproductive potential to use highly effective contraception during treatment with WELIREG and for at least 1 week after the last dose.

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

No studies on the effects on the ability to drive and use machines have been performed.

#### 4.8 ADVERSE EFFECTS (UNDESIRABLE EFFECTS)

##### *Clinical Trials Experience*

The safety of WELIREG was evaluated in an open-label Phase 2 clinical trial (Study-004), in 61 patients with VHL disease who had at least one measurable solid tumour localised to the kidney as defined by Response Evaluation Criteria in Solid Tumours version 1.1 (RECIST v1.1) and who did not require immediate surgery. Patients were treated with WELIREG 120 mg once daily (See **Section 5.1 Pharmacodynamic properties, Clinical Trials**). The median duration of exposure to WELIREG was 125 weeks (range: 8.4 to 163.1 weeks).

##### **Adverse events**

WELIREG was discontinued due to adverse events in 3 patients (4.9%): 1 patient for Grade 1 dizziness; one patient for haemorrhage intracranial and 1 patient due to death from a concomitantly administered toxic agent. Adverse events leading to dose interruption of WELIREG occurred in 27 patients (44.3%) and adverse events leading to dose reduction of WELIREG occurred in 9 patients (14.8%). The most common ( $\geq 10\%$ ) adverse event resulting in dose interruption or reduction of WELIREG was fatigue. Serious adverse events occurred in 14 patients (23.0%), of which 4 were determined to be drug-related (anaemia, urinary tract infection, haemorrhage intracranial, and hypoxia).

The most common adverse events ( $\geq 25\%$ ) that occurred in patients treated with WELIREG were anaemia, fatigue, headache, dizziness, and nausea. **Table 2** summarises the adverse events reported in patients treated with WELIREG.

**Table 2: Adverse Events Occurring in  $\geq 10\%$  of Patients Treated with WELIREG**

Adverse Event	WELIREG N=61	
	All Grades* (%)	Grade 3-4 (%)
<b>Blood and Lymphatic</b>		
Anaemia	90	10
<b>General</b>		
Fatigue	70	5
Oedema peripheral	13	0
<b>Nervous system</b>		
Headache	44	0
Dizziness	44	0
<b>Gastrointestinal</b>		
Nausea	36	0
Constipation	21	0
Abdominal pain	18	0
Diarrhoea	15	2
<b>Respiratory, Thoracic and Mediastinal</b>		
Dyspnea	23	2
<b>Infections</b>		
Upper respiratory tract infection	18	0
Urinary tract infection	13	2

<b>Investigations</b>		
Weight increased	16	2
Alanine aminotransferase increased	18	0
Aspartate aminotransferase increased	11	0
<b>Musculoskeletal and Connective Tissue</b>		
Myalgia	25	2
Arthralgia	21	2
Back pain	13	0
<b>Eye Disorders</b>		
Vision blurred	18	0
<b>Vascular</b>		
Hypertension	16	10
<b>Psychiatric Disorders</b>		
Insomnia	13	0
Anxiety	11	0

\*Graded per NCI CTCAE v4.0

### **Adverse drug reactions**

The most common adverse reactions under treatment with belzutifan were anaemia (90%), fatigue (70%), dizziness (44%) and nausea (36%).

The most common adverse reactions resulting in dose interruption of belzutifan were fatigue (13.1%), nausea (8.2%) and anaemia (4.9%). The most common adverse reactions resulting in dose reduction of belzutifan were fatigue (8.2%), anaemia (1.6%) and hypoxia (1.6%). Belzutifan was discontinued due to adverse reaction in 1 patient (1.6%) (Grade 1 dizziness).

#### Tabulated list of adverse reactions.

Adverse reactions reported in clinical studies with belzutifan are listed in the table below by MedDRA system organ class and by frequency. Frequencies are defined as very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ), rare ( $\geq 1/10,000$  to  $< 1/1,000$ ), and very rare ( $< 1/10,000$ ).



**Table 3: Adverse reactions for WELIREG 120 mg Once Daily\***

<b>System Organ Class</b>	<b>Adverse Drug Reaction</b>
<b>Blood and lymphatic disorders</b>	
Very Common	anaemia
<b>Nervous system disorders</b>	
Very Common	dizziness
<b>Respiratory, thoracic and mediastinal disorders</b>	
Very Common	dyspnoea
Common	hypoxia
<b>Gastrointestinal disorders</b>	
Very Common	nausea
<b>General disorders and administration site disorders</b>	
Very Common	fatigue
<b>Investigation</b>	
Very Common	weight increased

\*Adverse reaction frequencies presented in Table 3 may contain contributions from the underlying disease.

The safety of WELIREG was also evaluated in a Phase 1 clinical trial (Study-001), in 58 patients with non-VHL disease-associated advanced solid tumours, treated with WELIREG 120 mg once daily. Study-001 patients differed from VHL-associated RCC patients (Study-004). Study-001 patients were older, had worse ECOG PS, had metastatic disease, had prior therapies, had more comorbidities, and had lower baseline haemoglobin levels at treatment initiation. Study-001 had a median duration of exposure to WELIREG of 25.4 weeks (range: 1.1 to 145.9 weeks). WELIREG was discontinued due to adverse reactions in 6 patients (10.3%), most commonly due to hypoxia. Adverse reactions leading to dose interruption occurred in 24 patients (41.4%) and adverse reactions leading to dose reduction occurred in 6 patients (10.3%). The most common ( $\geq 10\%$ ) adverse reaction resulting in dose interruption or reduction was hypoxia. The most common adverse reactions ( $\geq 25\%$ ) that occurred in patients treated with WELIREG were anaemia, fatigue, dyspnoea, nausea, hypoxia, cough, vomiting, and peripheral oedema.

### ***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**

There is no specific treatment for WELIREG overdose. In cases of suspected overdose, if necessary, consider withholding WELIREG and instituting supportive care. The highest dose of WELIREG studied clinically was 240 mg total daily dose (120 mg twice a day or 240 mg once a day). Grade 3 hypoxia occurred at 120 mg twice a day and Grade 4 thrombocytopenia occurred at 240 mg once daily.

For information on the management of overdose, contact the Poisons Information Centre on 13 11 26 (Australia).

## 5 PHARMACOLOGICAL PROPERTIES

Pharmacotherapeutic group: not yet assigned, ATC code: not yet assigned.

### 5.1 PHARMACODYNAMIC PROPERTIES

#### *Mechanism of action*

Belzutifan is an inhibitor of hypoxia-inducible factor 2 alpha (HIF-2 $\alpha$ ). HIF-2 $\alpha$  is a transcription factor that plays a role in oxygen sensing by regulating genes that promote adaptation to hypoxia. Under normal oxygen levels, HIF-2 $\alpha$  is targeted for ubiquitin-proteasomal degradation by VHL protein. Lack of functional VHL protein results in stabilization and accumulation of HIF-2 $\alpha$ . Upon stabilization, HIF-2 $\alpha$  translocates into the nucleus and interacts with hypoxia-inducible factor 1 beta (HIF-1 $\beta$ ) domains to form a transcriptional complex that induces expression of downstream genes, including genes associated with cellular proliferation, angiogenesis, and tumour growth. Belzutifan binds to HIF-2 $\alpha$ , and in conditions of hypoxia or impairment of VHL protein function, belzutifan blocks the HIF-2 $\alpha$ -HIF-1 $\beta$  interaction, leading to reduced transcription and expression of HIF-2 $\alpha$  target genes. In vivo, belzutifan has demonstrated anti-tumour activity in mouse xenograft models of clear cell renal cell carcinoma (ccRCC).

The pharmacodynamic effects of belzutifan were evaluated in patients with VHL disease-associated RCC (Study-004) and in patients with non-VHL disease-associated advanced solid tumours (Study-001). Circulating plasma levels of erythropoietin (EPO) were monitored in patients as a pharmacodynamic marker of HIF-2 $\alpha$  inhibition. Treatment in patients with WELIREG resulted in reductions in EPO at all dose levels. Reductions in EPO were observed to be dose/exposure dependent and showed a plateauing effect on reduction at exposures achieved with doses above 120 mg once daily. In patients with VHL disease-associated RCC receiving 120 mg once daily of WELIREG, peak EPO suppression occurred at 2 weeks of treatment (mean percent decrease from baseline of approximately 60%). Mean EPO levels gradually returned to baseline values after 12 weeks of treatment.

The incidence of Grade 3 anaemia increased with higher belzutifan exposure in patients with baseline haemoglobin levels <12 g/dL (See **Section 4.4 Special Warnings and Precautions for Use**).

#### Cardiac Electrophysiology

At the recommended dose (120 mg once daily) for WELIREG, there were no clinically relevant effects on the QTc interval.

#### Pharmacogenomics

Belzutifan is primarily metabolised by UGT2B17 and CYP2C19. The activity of these enzymes varies among individuals who carry different genetic variants, which may impact belzutifan concentrations. Poor metabolisers are individuals who are considered to have no enzyme activity. Approximately 15% of Caucasians, 11% of Latinos, 6% of African Americans, 38% of South Asians, and 70% of East Asians are UGT2B17 poor metabolisers. Approximately 2% of Caucasians, 1% of Latinos, 5% of African Americans, 8% of South Asians, and 13% of East Asians are CYP2C19 poor metabolisers. Approximately 0.3% of Caucasians, 0.1% of Latinos, 0.3% of African Americans, 3% of South Asians, and 9% of East Asians are dual UGT2B17

and CYP2C19 poor metabolisers. Expected frequencies in the Japanese population for the UGT2B17, CYP2C19, and dual UGT2B17 and CYP2C19 poor metabolisers are approximately 77%, 19%, and 15%, respectively. Expected frequencies in the United States population for the UGT2B17, CYP2C19, and dual UGT2B17 and CYP2C19 poor metabolisers are approximately 16%, 3%, and 0.5%, respectively based on the reported proportion of the US population represented by major racial/ethnic groups.

The impact of CYP2C19 and UGT2B17 poor metabolisers on belzutifan exposure was assessed in a population PK analysis. Based on the analysis, VHL disease-associated RCC patients who are UGT2B17, CYP2C19, or dual UGT2B17 and CYP2C19 poor metabolisers, are projected to have 1.5-, 1.6-, or 2.3-fold the exposures (steady state  $AUC_{0-24hr}$ ), respectively, compared to a typical reference patient (UGT2B17 intermediate metaboliser, CYP2C19 non-poor metaboliser) for the recommended dose. No dose adjustment is recommended based on exposure-response analyses for efficacy and safety and the risk-benefit profile.

### ***Clinical trials***

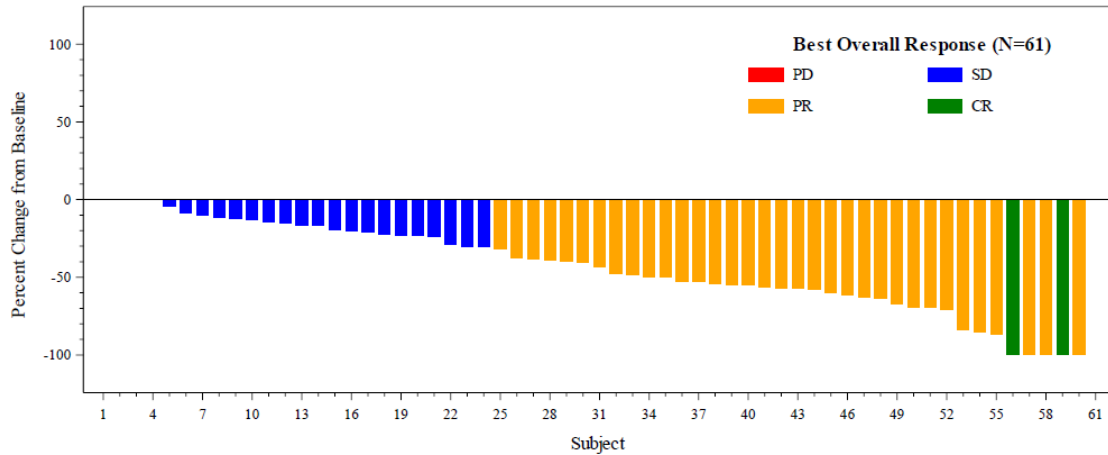
The efficacy of WELIREG was investigated in Study-004, an open-label Phase 2 clinical trial in 61 patients with VHL disease who had at least one measurable solid tumour (as defined by RECIST v1.1) localised to the kidney and who did not require immediate surgery. Patients received WELIREG at a dose of 120 mg once daily. Patients were evaluated radiologically approximately 12 weeks after initiation of treatment and every 12 weeks thereafter. Treatment was continued until progression of disease or unacceptable toxicity. The study excluded patients who had any evidence of metastatic disease, either RCC or other VHL disease-associated tumours, an immediate need for surgical intervention for tumour treatment, any major surgical procedure completed within 4 weeks prior to study enrollment, any major cardiovascular event within 6 months prior to study drug administration, or prior systemic treatments for VHL disease-associated RCC.

The study population characteristics were: median age of 41 years, 3.3% age 65 or over; 52.5% male; 90.2% White; and 82.0% had an ECOG PS of 0 and 16.4% had an ECOG PS of 1. Seventy-seven percent of patients had prior RCC surgical procedures. Other VHL disease-associated tumours in patients included pancreatic lesions (100.0%) of which 36.1% were pancreatic neuroendocrine tumours, CNS haemangioblastomas (82.0%), and retinal angiomas (19.7%).

The primary efficacy endpoint for the treatment of VHL disease-associated RCC was overall response rate (ORR) measured by Integrated Radiology and Oncology Assessment (IRO) assessment using RECIST v1.1 as assessed by a central independent review committee (IRC). Additional efficacy endpoints included disease control rate (DCR), response duration, time to response (TTR), and time to surgery (TTS). Radiographic endpoints were assessed by IRC using RECIST v1.1. The clinical benefit of WELIREG in reducing RCC tumour size and slowing the growth of tumours was supported by pre-treatment and post-treatment linear growth rate of 3.52 and 3.37 mm/year respectively in Study-004. A total of 91.8% of participants (56/61) had a decrease in the sum of target tumour diameters, including 3.3% (2/61) achieved complete response (**Figure 1**). After a median follow-up time of 29.2 months, one out of 61 (2%) patients required an RCC tumour reduction procedure during treatment. In a natural history study, RCC patients undergoing active surveillance have demonstrated linear

tumour growth of 3.56 mm/year and showed that 28.7% of patients had their first tumour reduction procedure within 24 months of follow-up. **Table 4** summarises the efficacy results for VHL disease-associated RCC tumours in Study-004.

**Figure 1: Waterfall Plot- Percentage Change in Total Sum of RCC Target Lesions Diameters From Baseline to Post-Baseline Maximum % Reduction (RECIST 1.1)- IRC Efficacy Analysis Set – Patients with Evaluable RCC Tumours at Baseline**



Subjects without either post-baseline evaluable lesion measurements or target lesions or with all post-baselinonon-evaluable time-point responses appear as blank on the right of the figure. Number (%) of patients with maximum % reduction in sum of diameters of target lesions < 0 = 56 ( 91.8) Date of Data Cut-off: 15JUL2021

**Table 4: Efficacy Results for WELIREG for VHL Disease-Associated RCC Tumours**

Endpoint	WELIREG 120 mg daily n=61
<b>Overall Response Rate</b>	
ORR % (95% CI)	59.0% (45.7, 71.4)
Complete response	3.3%
Partial response	55.7%
Stable disease	39.3%
Disease control rate <sup>†</sup>	98.4%
<b>Response Duration<sup>‡</sup></b>	
Median in weeks (range)	Not reached (36.1+, 119.9+)
% (n) with duration ≥ 18 months	95.0% (19)
<b>Time to Response</b>	
Median in weeks (range)	47.6 (11.6, 96.6)
<b>Time to Surgery</b>	
Median in weeks (95% CI)	Not reached (NE, NE)

<sup>†</sup> Based on best response of stable disease or better

<sup>‡</sup> Based on Kaplan-Meier estimates

+ Denotes ongoing response

NE = Not estimable

Efficacy endpoints for the treatment of other VHL disease-associated tumours included ORR, DCR and response duration, as assessed by IRC using RECIST v1.1. These results are shown in **Table 5**.

**Table 5: Efficacy Results for WELIREG for Other VHL Disease-Associated Tumours**

Endpoint	WELIREG 120 mg daily n=61	
	Patients with Evaluable Pancreatic Neuroendocrine Tumours  n=20	Patients with Evaluable CNS Haemangioblastomas  n=50
<b>Overall Response Rate</b>		
ORR % (95% CI)	90.0% (68.3, 98.8)	38% (24.7, 52.8)
Complete response	15.0%	6.0%
Partial response	75.0%	32.0%
Stable disease	10.0%	52.0%
Disease Control Rate <sup>†</sup>	100.0%	90.0%
<b>Response Duration<sup>‡</sup></b>		
Median in weeks (range)	Not reached (48.0+, 134.9+)	Not reached (16.1+, 121.9+)
% (n) with duration ≥ 18 months	100.0% (13)	94.4% (11)

<sup>†</sup> Based on best response of stable disease or better

<sup>‡</sup> Based on Kaplan-Meier estimates

+ Denotes ongoing response

## 5.2 PHARMACOKINETIC PROPERTIES

The pharmacokinetics of belzutifan are similar in healthy subjects and patients with solid tumours including advanced RCC. Based on a population-PK model analysis, the steady-state geometric mean (GCV%) for  $C_{max}$  and  $AUC_{0-24hr}$  for 120 mg once daily in patients with VHL disease-associated RCC are predicted to be 1.3 µg/mL (42.2%) and 16.7 µg·hr/mL (52.3%), respectively. Steady state is reached after approximately 3 days of once daily dosing with WELIREG. Plasma  $C_{max}$  and AUC of belzutifan increased in a dose-proportional manner following doses up to the recommended dose.

### Absorption

Following single-dose oral administration of 120 mg of WELIREG, peak plasma concentrations (median  $T_{max}$ ) of belzutifan occurred at 1 to 2 hours postdose.

### Effect of Food

A high-fat, high-calorie meal delayed peak belzutifan concentration by approximately 2 hours but, had no effect on exposure (AUC). There was a modest decrease of  $C_{max}$  by 35% following consumption of a high-fat, high-calorie meal, but this was not clinically meaningful. Therefore, WELIREG can be taken without regard to food.

### ***Distribution***

The mean steady-state apparent volume of distribution of belzutifan following an oral dose is 130 L. Plasma protein binding of belzutifan is 45%. The blood-to-plasma concentration ratio of belzutifan is 0.88.

### ***Metabolism***

Belzutifan is primarily metabolised by UGT2B17 and CYP2C19 and to a lesser extent by CYP3A4. Both UGT2B17 and CYP2C19 display genetic polymorphisms (See **Section 5.1 Pharmacodynamic properties**).

### ***Excretion***

The mean apparent clearance of belzutifan is 7.3 L/hr and the mean elimination half-life is 14 hrs.

### ***Special Populations***

#### **Renal Impairment**

No relevant increase in exposure (AUC) was observed for subjects with mild or moderate renal impairment. Renal impairment (as evaluated by eGFR) was not identified as a significant covariate in the population pharmacokinetic analysis. The pharmacokinetics of belzutifan have not been studied in patients with severe renal impairment (See **Section 4.2 Dose and Method of Administration** and **Section 4.4 Special Warnings and Precautions for Use**).

#### **Hepatic Impairment**

No relevant increase in exposure (AUC) was observed for subjects with mild hepatic impairment (using NCI index) based on population pharmacokinetic analysis. The pharmacokinetics of belzutifan have not been studied in patients with moderate or severe hepatic impairment (See **Section 4.2 Dose and Method of Administration** and **Section 4.4 Special Warnings and Precautions for Use**).

#### **Dual UGT2B17 and CYP2C19 Poor Metabolisers**

Patients who are poor metabolisers of UGT2B17 and CYP2C19 had higher belzutifan AUC (See **Section 5.1 Pharmacodynamic properties**).

#### **Paediatric**

No studies with WELIREG have been performed in pediatric patients.

#### **Effects of Age, Gender, Ethnicity, Race, and Body Weight**

Based on a population pharmacokinetic analysis, age, gender, ethnicity, race, and body weight do not have a clinically meaningful effect on the pharmacokinetics of belzutifan. Potential differences in exposure across races are possible due to different frequencies of metabolising enzymes (See **Section 5.1 Pharmacodynamic properties**).

## Drug Interaction Studies

### **In Vitro Assessment of Drug Interactions**

Belzutifan is a substrate of UGT2B17, CYP2C19 and CYP3A4. Active transport is not an important determinant of belzutifan disposition. Belzutifan is not an inhibitor of CYP enzymes or transporters with the exception of MATE2K. Belzutifan does not induce CYP1A2 or CYP2B6, however, belzutifan induces CYP3A4 in a concentration dependent manner.

### **In Vivo Assessment of Drug Interactions**

In a clinical study, repeat administration of WELIREG 120 mg QD resulted in a 40% reduction in midazolam AUC, an effect consistent with a weak CYP3A4 inducer. Based on PBPK modeling, WELIREG may exhibit moderate CYP3A4 induction in patients who have higher belzutifan plasma exposures (See **Section 4.5 Interactions with other medicines and other forms of interactions** and **Section 5.1 Pharmacodynamic properties**).

## **5.3 PRECLINICAL SAFETY DATA**

### ***Genotoxicity***

Belzutifan was not genotoxic in *in vitro* bacterial mutagenicity assay and micronucleus assay in human lymphocytes, and an *in vivo* rat micronucleus assay.

### ***Carcinogenicity***

Carcinogenicity studies have not been conducted with belzutifan.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 LIST OF EXCIPIENTS**

WELIREG tablets contain the inactive ingredients: croscarmellose sodium, hypromellose acetate succinate, magnesium stearate, mannitol, microcrystalline cellulose, and silicon dioxide.

The film-coat contains indigo carmine aluminium lake, macrogol, polyvinyl alcohol, purified talc, titanium dioxide.

### **6.2 INCOMPATIBILITIES**

Not applicable

### **6.3 SHELF LIFE**

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

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

Store below 30°C.

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

HDPE bottle with child-resistant closure in pack size of 90 tablets.

## 6.6 SPECIAL PRECAUTIONS FOR DISPOSAL

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

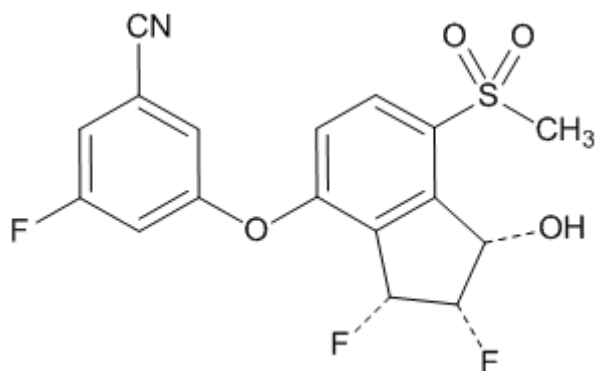
## 6.7 PHYSICOCHEMICAL PROPERTIES

Belzutifan is a white to light brown powder that is soluble in acetonitrile, dimethoxyethane and acetone, sparingly soluble in ethyl acetate, very slightly soluble in isopropanol and toluene, and insoluble in water.

### **Chemical structure**

The chemical name of belzutifan is 3-[[[(1S,2S,3R)-2,3-Difluoro-2,3-dihydro-1-hydroxy-7-(methylsulfonyl)-1H-inden-4-yl]oxy]-5-fluorobenzonitrile. The molecular formula is  $C_{17}H_{12}F_3NO_4S$  and the molecular weight is 383.34 Daltons.

The chemical structure is:



### **CAS number**

1672668-24-4

## 7 MEDICINE SCHEDULE (POISONS STANDARD)

Prescription only medicine (Schedule 4)

## 8 SPONSOR

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## 9 DATE OF FIRST APPROVAL

22 December 2022

## 10 DATE OF REVISION

13 August 2024



## SUMMARY TABLE OF CHANGES

Section Changed	Summary of new information
All	Minor formatting/editorial revisions throughout.

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