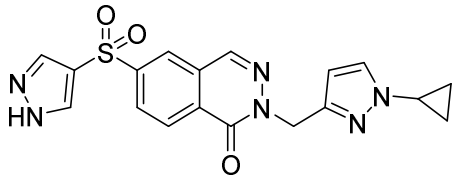
CLAIMS

1. A compound of formula (I):



;

which is 6-((1H-pyrazol-4-yl)sulfonyl)-2-((1-cyclopropyl-1H-pyrazol-3-yl)methyl)phthalazin-1(2H)-one;
or a salt and/or solvate thereof.

2. The compound or a salt and/or solvate thereof according to claim 1 which is a compound of formula (I) or a pharmaceutically acceptable salt and/or solvate thereof.

3. The pharmaceutically acceptable salt and solvate thereof according to claim 2.

4. The pharmaceutically acceptable salt according to claim 2.

5. The pharmaceutically acceptable solvate according to claim 2.

6. The compound according to claim 1.

7. A pharmaceutical composition comprising the compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6 and one or more pharmaceutically acceptable diluents or carriers.

8. The compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6, or the pharmaceutical composition according to claim 7, for use as a medicament.

9. The compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6, or the pharmaceutical composition according to claim 7, for use in treating or preventing a disease, disorder or condition associated with the function of PK, in particular PKM2 and/or PKLR.

10. Use of the compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6, or the pharmaceutical composition according to claim 7, in the manufacture of a medicament for treating or preventing a disease, disorder or condition

associated with the function of PK, in particular PKM2 and/or PKLR.

11. The compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6, or the pharmaceutical composition according to claim 7, for use in treating or preventing an inflammatory disease, a disease associated with an undesirable immune response, cancer, obesity, a diabetic disease or a blood disorder.

12. Use of the compound or a pharmaceutically acceptable salt and/or solvate thereof according to any one of claims 2 to 6, or the pharmaceutical composition according to claim 7, in the manufacture of a medicament for treating or preventing an inflammatory disease, a disease associated with an undesirable immune response, cancer, obesity, a diabetic disease or a blood disorder.

13. The compound or a pharmaceutically acceptable salt and/or solvate thereof for use, pharmaceutical composition for use, or use according to any one of claims 11 to 12 wherein:

- the inflammatory disease or disease associated with an undesirable immune response is, or is associated with, a disease selected from the group consisting of: psoriasis (including chronic plaque, erythrodermic, pustular, guttate, inverse and nail variants), asthma, chronic obstructive pulmonary disease (COPD, including chronic bronchitis and emphysema), heart failure (including left ventricular failure), myocardial infarction, angina pectoris, other atherosclerosis and/or atherothrombosis-related disorders (including peripheral vascular disease and ischaemic stroke), a mitochondrial and neurodegenerative disease (such as Parkinson's disease, Alzheimer's disease, Huntington's disease, amyotrophic lateral sclerosis, retinitis pigmentosa or mitochondrial encephalomyopathy), autoimmune paraneoplastic retinopathy, transplantation rejection (including antibody-mediated and T cell-mediated forms), multiple sclerosis, transverse myelitis, ischaemia-reperfusion injury (e.g. during elective surgery such as cardiopulmonary bypass for coronary artery bypass grafting or other cardiac surgery, following percutaneous coronary intervention, following treatment of acute ST-elevation myocardial infarction or ischaemic stroke, organ transplantation, or acute compartment syndrome), AGE-induced genome damage, an inflammatory bowel disease (e.g. Crohn's disease or ulcerative colitis), primary sclerosing cholangitis (PSC), PSC-autoimmune hepatitis overlap syndrome, non-alcoholic fatty liver disease (non-alcoholic steatohepatitis), rheumatica, granuloma annulare, cutaneous lupus erythematosus (CLE), systemic lupus erythematosus (SLE), lupus nephritis, drug-induced lupus, autoimmune myocarditis or myopericarditis, Dressler's syndrome, giant cell myocarditis, post-pericardiotomy syndrome, drug-induced hypersensitivity syndromes (including hypersensitivity myocarditis), eczema, sarcoidosis, erythema nodosum, acute disseminated encephalomyelitis (ADEM), neuromyelitis optica spectrum disorders, MOG (myelin oligodendrocyte glycoprotein) antibody-associated disorders (including MOG-EM), optic neuritis,

CLIPPERS (chronic lymphocytic inflammation with pontine perivascular enhancement responsive to steroids), diffuse myelinoclastic sclerosis, Addison's disease, alopecia areata, ankylosing spondylitis, other spondyloarthritides (including peripheral spondyloarthritis, that is associated with psoriasis, inflammatory bowel disease, reactive arthritis or juvenile onset forms), antiphospholipid antibody syndrome, autoimmune hemolytic anaemia, autoimmune hepatitis, autoimmune inner ear disease, pemphigoid (including bullous pemphigoid, mucous membrane pemphigoid, cicatricial pemphigoid, herpes gestationis or pemphigoid gestationis, ocular cicatricial pemphigoid), linear IgA disease, Behçet's disease, celiac disease, Chagas disease, dermatomyositis, diabetes mellitus type I, endometriosis, Goodpasture's syndrome, Graves' disease, Guillain-Barre syndrome and its subtypes (including acute inflammatory demyelinating polyneuropathy, AIDP, acute motor axonal neuropathy (AMAN), acute motor and sensory axonal neuropathy (AMSAN), pharyngeal-cervical-brachial variant, Miller-Fisher variant and Bickerstaff's brainstem encephalitis), progressive inflammatory neuropathy, Hashimoto's disease, hidradenitis suppurativa, inclusion body myositis, necrotising myopathy, Kawasaki disease, IgA nephropathy, Henoch-Schonlein purpura, idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura (TTP), Evans' syndrome, interstitial cystitis, mixed connective tissue disease, undifferentiated connective tissue disease, morphea, myasthenia gravis (including MuSK antibody positive and seronegative variants), narcolepsy, neuromyotonia, pemphigus vulgaris, pernicious anaemia, psoriatic arthritis, polymyositis, primary biliary cholangitis (also known as primary biliary cirrhosis), rheumatoid arthritis, palindromic rheumatism, schizophrenia, autoimmune (meningo-)encephalitis syndromes, scleroderma, Sjogren's syndrome, stiff person syndrome, polymylagia rheumatica, giant cell arteritis (temporal arteritis), Takayasu arteritis, polyarteritis nodosa, Kawasaki disease, granulomatosis with polyangitis (GPA; formerly known as Wegener's granulomatosis), eosinophilic granulomatosis with polyangiitis (EGPA; formerly known as Churg-Strauss syndrome), microscopic polyarteritis/polyangiitis, hypocomplementaemic urticarial vasculitis, hypersensitivity vasculitis, cryoglobulinemia, thromboangiitis obliterans (Buerger's disease), vasculitis, leukocytoclastic vasculitis, vitiligo, acute disseminated encephalomyelitis, adrenoleukodystrophy, Alexander's disease, Alper's disease, balo concentric sclerosis or Marburg disease, cryptogenic organising pneumonia (formerly known as bronchiolitis obliterans organizing pneumonia), Canavan disease, central nervous system vasculitic syndrome, Charcot-Marie-Tooth disease, childhood ataxia with central nervous system hypomyelination, chronic inflammatory demyelinating polyneuropathy (CIDP), diabetic retinopathy, globoid cell leukodystrophy (Krabbe disease), graft-versus-host disease (GVHD) (including acute and chronic forms, as well as intestinal GVHD), hepatitis C (HCV) infection or complication, herpes simplex viral infection or complication, human immunodeficiency virus (HIV) infection or complication, lichen planus, monomelic amyotrophy, fibrosis, cystic fibrosis, pulmonary arterial hypertension (PAH, including idiopathic PAH), lung sarcoidosis, idiopathic pulmonary fibrosis, kidney fibrosis, paediatric asthma, atopic dermatitis, allergic

dermatitis, contact dermatitis, allergic rhinitis, rhinitis, sinusitis, conjunctivitis, allergic conjunctivitis, keratoconjunctivitis sicca, dry eye, xerophthalmia, glaucoma, macular oedema, diabetic macular oedema, central retinal vein occlusion (CRVO), macular degeneration (including dry and/or wet age related macular degeneration, AMD), post-operative cataract inflammation, uveitis (including posterior, anterior, intermediate and pan uveitis), iridocyclitis, scleritis, corneal graft and limbal cell transplant rejection, gluten sensitive enteropathy (coeliac disease), dermatitis herpetiformis, eosinophilic esophagitis, achalasia, autoimmune dysautonomia, autoimmune encephalomyelitis, autoimmune oophoritis, autoimmune orchitis, autoimmune pancreatitis, aortitis and periaortitis, autoimmune retinopathy, autoimmune urticaria, Behcet's disease, (idiopathic) Castleman's disease, Cogan's syndrome, IgG4-related disease, retroperitoneal fibrosis, juvenile idiopathic arthritis including systemic juvenile idiopathic arthritis (Still's disease), adult-onset Still's disease, ligneous conjunctivitis, Mooren's ulcer, pityriasis lichenoides et varioliformis acuta (PLEVA, also known as Mucha-Habermann disease), multifocal motor neuropathy (MMN), paediatric acute-onset neuropsychiatric syndrome (PANS) (including paediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS)), paraneoplastic syndromes (including paraneoplastic cerebellar degeneration, Lambert-Eaton myaesthenic syndrome, limbic encephalitis, brainstem encephalitis, opsoclonus myoclonus ataxia syndrome, anti-NMDA receptor encephalitis, thymoma-associated multiorgan autoimmunity), perivenous encephalomyelitis, reflex sympathetic dystrophy, relapsing polychondritis, sperm & testicular autoimmunity, Susac's syndrome, Tolosa-Hunt syndrome, Vogt-Koyanagi-Harada Disease, anti-synthetase syndrome, autoimmune enteropathy, immune dysregulation polyendocrinopathy enteropathy X-linked (IPEX), microscopic colitis, autoimmune lymphoproliferative syndrome (ALPS), autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy syndrome (APEX), gout, pseudogout, amyloid (including AA or secondary amyloidosis), eosinophilic fasciitis (Shulman syndrome) progesterone hypersensitivity (including progesterone dermatitis), familial Mediterranean fever (FMF), tumour necrosis factor (TNF) receptor-associated periodic fever syndrome (TRAPS), hyperimmunoglobulinaemia D with periodic fever syndrome (HIDS), PAPA (pyogenic arthritis, pyoderma gangrenosum, severe cystic acne) syndrome, deficiency of interleukin-1 receptor antagonist (DIRA), deficiency of the interleukin-36-receptor antagonist (DITRA), cryopyrin-associated periodic syndromes (CAPS) (including familial cold autoinflammatory syndrome [FCAS], Muckle-Wells syndrome, neonatal onset multisystem inflammatory disease [NOMID]), NLRP12-associated autoinflammatory disorders (NLRP12AD), periodic fever aphthous stomatitis (PFAPA), chronic atypical neutrophilic dermatosis with lipodystrophy and elevated temperature (CANDLE), Majeed syndrome, Blau syndrome (also known as juvenile systemic granulomatosis), macrophage activation syndrome, chronic recurrent multifocal osteomyelitis (CRMO), familial cold autoinflammatory syndrome, mutant adenosine deaminase 2 and monogenic interferonopathies (including Aicardi-Goutières syndrome, retinal vasculopathy with cerebral leukodystrophy, spondyloenchondrodysplasia,

STING [stimulator of interferon genes]-associated vasculopathy with onset in infancy, proteasome associated autoinflammatory syndromes, familial chilblain lupus, dyschromatosis symmetrica hereditaria), Schnitzler syndrome; familial cylindromatosis, congenital B cell lymphocytosis, OTULIN-related autoinflammatory syndrome, type 2 diabetes mellitus, insulin resistance and the metabolic syndrome (including obesity-associated inflammation), atherosclerotic disorders (e.g. myocardial infarction, angina, ischaemic heart failure, ischaemic nephropathy, ischaemic stroke, peripheral vascular disease, aortic aneurysm), and renal inflammatory disorders (e.g. diabetic nephropathy, membranous nephropathy, minimal change disease, crescentic glomerulonephritis, acute kidney injury, renal transplantation); and

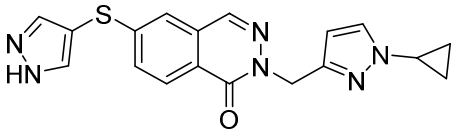
- the cancer is selected from the group consisting of: acute lymphoblastic leukaemia, adult; acute lymphoblastic leukaemia, childhood; acute myeloid leukaemia, adult; adrenocortical carcinoma; adrenocortical carcinoma, childhood; aids-related lymphoma; aids-related malignancies; anal cancer; astrocytoma, childhood cerebellar; astrocytoma, childhood cerebral; Barrett's esophagus (pre-malignant syndrome); bile duct cancer, extrahepatic; bladder cancer; bladder cancer, childhood; bone cancer, osteosarcoma/malignant fibrous histiocytoma; brain stem glioma, childhood; brain tumour, adult; brain tumour, brain stem glioma, childhood; brain tumour, cerebellar astrocytoma, childhood; brain tumour, cerebral astrocytoma/malignant glioma, childhood; brain tumour, ependymoma, childhood; brain tumour, medulloblastoma, childhood; brain tumour, supratentorial primitive neuroectodermal tumours, childhood; brain tumour, visual pathway and hypothalamic glioma, childhood; brain tumour, childhood (other); breast cancer; breast cancer and pregnancy; breast cancer, childhood; breast cancer, male; bronchial adenomas/carcinoids, childhood; carcinoid tumour, childhood; carcinoid tumour, gastrointestinal; carcinoma, adrenocortical; carcinoma, islet cell; carcinoma of unknown primary; central nervous system lymphoma, primary; cerebellar astrocytoma, childhood; cerebral astrocytoma/malignant glioma, childhood; cervical cancer; childhood cancers; chronic lymphocytic leukaemia; chronic myelogenous leukaemia; chronic myeloproliferative disorders; clear cell sarcoma of tendon sheaths; colon cancer; colorectal cancer; colorectal cancer, childhood; cutaneous t-cell lymphoma; endometrial cancer; ependymoma, childhood; epithelial cancer, ovarian; oesophageal cancer; oesophageal cancer, childhood; Ewing's family of tumours; extracranial germ cell tumour, childhood; extragonadal germ cell tumour; extrahepatic bile duct cancer; eye cancer, intraocular melanoma; eye cancer, retinoblastoma; gallbladder cancer; gastric (stomach) cancer; gastric (stomach) cancer, childhood; gastrointestinal carcinoid tumour; germ cell tumour, extracranial, childhood; germ cell tumour, extragonadal; germ cell tumour, ovarian; gestational trophoblastic tumour; glioma, childhood brain stem; glioma, childhood visual pathway and hypothalamic; hairy cell leukaemia; head and neck cancer; hepatocellular (liver) cancer; hepatocellular (liver) cancer, adult (primary); hepatocellular (liver) cancer, childhood (primary); cancer of the esophagus; Hodgkin’s lymphoma; Hodgkin’s lymphoma, adult; Hodgkin’s lymphoma, childhood; Hodgkin’s lymphoma during pregnancy; hypopharyngeal cancer; hypothalamic and visual pathway glioma,

childhood; intraocular melanoma; islet cell carcinoma (endocrine pancreas); cancer of the endocrine system; Kaposi's sarcoma; kidney cancer; laryngeal cancer; laryngeal cancer, childhood; leukaemia, acute lymphoblastic, adult; leukaemia, acute lymphoblastic, childhood; leukaemia, acute myeloid, adult; leukaemia, acute myeloid, childhood; leukaemia, chronic lymphocytic; leukaemia, chronic myelogenous; leukaemia, hairy cell; lymphocytic lymphoma; lip and oral cavity cancer; liver cancer, adult (primary); liver cancer, childhood (primary); lung cancer; lung cancer, non-small cell; lung cancer, small cell; lymphoblastic leukaemia, adult acute; lymphoblastic leukaemia, childhood acute; lymphocytic leukaemia, chronic; lymphoma, aids-related; lymphoma, central nervous system (primary); lymphoma, cutaneous t-cell; lymphoma, Hodgkin's, adult; lymphoma, Hodgkin's, childhood; lymphoma, Hodgkin's during pregnancy; lymphoma, non-Hodgkin's, adult; lymphoma, non-Hodgkin's, childhood; lymphoma, non-Hodgkin's during pregnancy; lymphoma, primary central nervous system; macroglobulinemia, Waldenstrom's; male breast cancer; malignant mesothelioma, adult; malignant mesothelioma, childhood; malignant thymoma; medulloblastoma, childhood; melanoma; melanoma, intraocular; Merkel cell carcinoma; mesothelioma, malignant; metastatic squamous neck cancer with occult primary; multiple endocrine neoplasia syndrome, childhood; multiple myeloma/plasma cell neoplasm; mycosis fungoides; myelodysplastic syndromes; myelogenous leukaemia, chronic; myeloid leukaemia, childhood acute; myeloma, multiple; myeloproliferative disorders, chronic; nasal cavity and paranasal sinus cancer; nasopharyngeal cancer; nasopharyngeal cancer, childhood; neoplastic cutaneous disease; neuroblastoma; non-Hodgkin's lymphoma, adult; non-Hodgkin's lymphoma, childhood; non-Hodgkin's lymphoma during pregnancy; non-small cell lung cancer; neoplasms of the central nervous system; oat-cell cancer; oral cancer, childhood; oral cavity and lip cancer; oropharyngeal cancer; osteosarcoma/malignant fibrous histiocytoma of bone; ovarian cancer; ovarian cancer, childhood; ovarian epithelial cancer; ovarian germ cell tumour; ovarian low malignant potential tumour; pediatric malignancy; pancreatic cancer; pancreatic cancer, childhood; pancreatic cancer, islet cell; paranasal sinus and nasal cavity cancer; parathyroid cancer; penile cancer; pheochromocytoma; pineal and supratentorial primitive neuroectodermal tumours, childhood; pituitary tumour; plasma cell neoplasm/multiple myeloma; pleuropulmonary blastoma; pregnancy and breast cancer; pregnancy and Hodgkin's lymphoma; pregnancy and non-Hodgkin's lymphoma; primary central nervous system lymphoma; primary liver cancer, adult; primary liver cancer, childhood; prostate cancer (particularly hormone-refractory); chronic or acute leukemia; solid tumors of childhood; hypereosinophilia; rectal cancer; renal cell (kidney) cancer; renal cell cancer, childhood; renal pelvis and ureter, transitional cell cancer; retinoblastoma; rhabdomyosarcoma, childhood; salivary gland cancer; salivary gland cancer, childhood; sarcoma, Ewing's family of tumours; sarcoma, Kaposi's; sarcoma (osteosarcoma)/malignant fibrous histiocytoma of bone; sarcoma, rhabdomyosarcoma, childhood; sarcomas of soft tissues; sarcoma, soft tissue, adult; sarcoma, soft tissue, childhood; Sezary syndrome; skin cancer; skin cancer, childhood; skin cancer (melanoma); skin carcinoma,

Merkel cell; small cell lung cancer; dermatofibrosarcoma protuberans; small intestine cancer; soft tissue sarcoma, adult; soft tissue sarcoma, childhood; cancer of the head and neck; squamous neck cancer with occult primary, metastatic; stomach (gastric) cancer; stomach (gastric) cancer, childhood; supratentorial primitive neuroectodermal tumours, childhood; t-cell lymphoma, cutaneous; testicular cancer; thymoma, childhood; thymoma, malignant; thyroid cancer; thyroid cancer, childhood; transitional cell cancer of the renal pelvis and ureter; trophoblastic tumour, gestational; unknown primary site, cancer of, childhood; unusual cancers of childhood; ureter and renal pelvis, transitional cell cancer; urethral cancer; cancer of the ureter; cancer of the penis; gynecologic tumors; uterine cancer; uterine sarcoma; carcinoma of the fallopian tubes; carcinoma of the endometrium; vaginal cancer; carcinoma of the vagina; carcinoma of the vulva; visual pathway and hypothalamic glioma, childhood; vulvar cancer; Waldenstrom's macro globulinemia; and Wilms' tumour.

14. The compound or a pharmaceutically acceptable salt and/or solvate thereof for use, pharmaceutical composition for use, or use according to claim 13, wherein the inflammatory disease or disease associated with an undesirable immune response is selected from the group consisting of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, systemic lupus erythematosus, multiple sclerosis, psoriasis, inflammatory bowel disease (including ulcerative colitis and Crohn’s disease), atopic dermatitis, fibrosis, uveitis, cryopyrin-associated periodic syndromes, Muckle-Wells syndrome, juvenile idiopathic arthritis, chronic obstructive pulmonary disease and asthma.

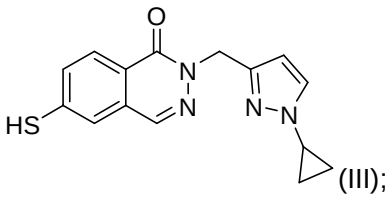
15. A compound of formula (II):



(II);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof.

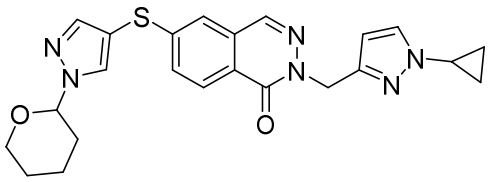
16. A compound of formula (III):



(III);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof.

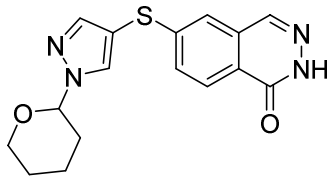
17. A compound of formula (IV):



(IV);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof.

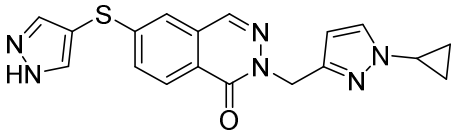
18. A compound of formula (V):



(V);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof.

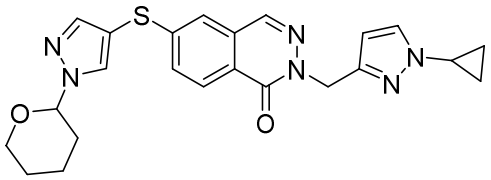
19. A process for the preparation of a compound of formula (I) or a salt and/or solvate thereof according to any one of claims 1 to 6 which comprises oxidising a compound of formula (II):



(II);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof.

20. A process for the preparation of a compound of formula (I) or a salt and/or solvate thereof according to any one of claims 1 to 6 which comprises oxidising a compound of formula (IV):



(IV);

or a salt (such as a pharmaceutically acceptable salt) and/or solvate thereof, wherein the tetrahydropyran ring is removed under said oxidising conditions.