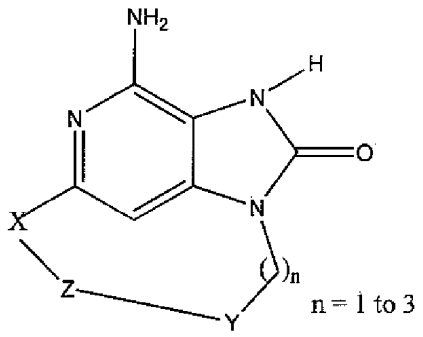
975-82. Orally available small molecule IFN inducers offer the potential advantages of reduced immunogenicity and convenience of administration. Thus, novel IFN inducers are potentially effective new class of drugs for treating virus infections. An example of a small molecule IFN inducer having antiviral effect see De Clercq, E.; Descamps, J.; De Somer, P. *Science* 1978, *200*, 563-565.

IFN-alfa is also given in combination with other drugs in the treatment of certain types of cancer (Eur. J. Cancer 46, 2849–57, and Cancer Res. 1992, *52*, 1056). TLR 7/8 agonists are also of interest as vaccine adjuvants because of their ability to induce pronounced Th1 response (Hum. Vaccines 2010, 6, 322-335, and Hum. Vaccines 2009, 5, 381–394).

In accordance with the present disclosure, in one aspect, a compound of formula (I) is provided



(I)

and pharmaceutically accepted salts thereof, wherein

X is oxygen, nitrogen or sulfur

Y represents an aromatic ring or heterocyclic ring comprising at least a nitrogen, optionally substituted by one or more substituents independently selected from C_{1-6}alkyl, C_{1-4}alkoxy, trifluoromethyl or halogen,

Z represents C_{1-10} saturated or unsaturated alkyl optionally substituted by an alkyl or alkylhydroxyl;

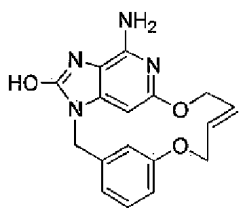
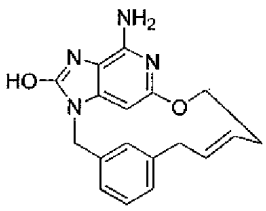
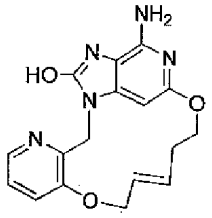
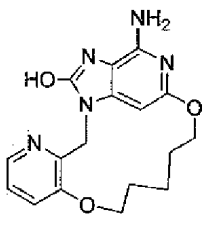
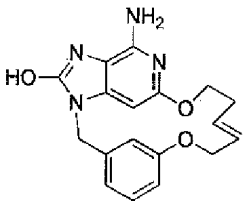
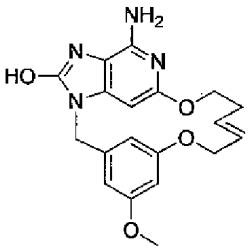
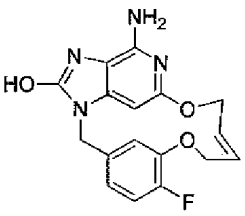
or Z represents C_{1-6}alkyl -NH-C(O)- C_{1-6}alkyl-, C_{1-6}alkyl-NH- or C_{1-6}alkyl -NH-C(O)- C_{1-6}alkyl -O-;

or Z represents C_{1-10}alkyl -O- wherein said alkyl is unsaturated or saturated and can optionally be substituted by an alkyl or alkylhydroxyl ,

or Z represents C_{1-6}alkyl-O-C_{1-6}alkyl- wherein said alkyl is unsaturated or saturated and can optionally be substituted by an alkyl or alkylhydroxyl

or Z represents C_{1-6}alkyl-O-C_{1-6}alkyl-O- wherein said alkyl is unsaturated or saturated and can optionally be substituted by an alkyl or alkylhydroxyl.

Preferred compounds having one of the following formula's according to the disclosure were selected from the group of:

In another aspect, there is provided a pharmaceutical composition comprising a compound of formula (I) or a pharmaceutically acceptable salt, solvate or polymorph thereof together with one or more pharmaceutically acceptable excipients, diluents or carriers.

In another aspect, there is provided a compound of formula (I) or a pharmaceutically acceptable salt, solvate or polymorph thereof or a pharmaceutical composition above mentioned for use as a medicament.

In another aspect, there is provided a compound of formula (I) or a pharmaceutically acceptable salt, solvate or polymorph thereof or a pharmaceutical composition above mentioned for use in the treatment of a disorder in which the modulation of TLR7 is involved.

The term "alkyl" refers to a straight-chain or branched-chain mostly saturated (but in specific compounds according to the invention being unsaturated) aliphatic hydrocarbon containing the specified number of carbon atoms.

The term "halogen" refers to fluorine, chlorine, bromine or iodine.

The term "alkoxy" refers to an alkyl (carbon and hydrogen chain) group singular bonded to oxygen like for instance a methoxy group or ethoxy group.

Pharmaceutically acceptable salts of the compounds of formula (I) include the acid addition and base salts thereof. Suitable acid addition salts are formed from acids which form non-toxic salts. Suitable base salts are formed from bases which form non-toxic salts.

The compounds of the invention may also exist in unsolvated and solvated forms. The term "solvate" is used herein to describe a molecular complex comprising the compound of the invention and one or more pharmaceutically acceptable solvent molecules, for example, ethanol.