

P-66

Pharmacological Overview of the Drug Candidate BGP-15

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1. Introduction

BGP-15 is a drug candidate that was originally developed against insulin resistance by Hungarian researchers. This compound was discovered while investigating heat shock proteins, which are essentials in the functioning of the immune system [1]. BGP-15 is a versatile compound, many research groups pay outstanding attention to the molecule and investigate its effects all around the world. It has been reported to be safe and well tolerated, it entered into clinical phase II [2]. In the followings we summarize BGP-15's effects to increase the knowledge about the molecule.

2. Effects

BGP-15 exhibits numerous beneficial effects, it has been investigated and studied in a wide range of pathological conditions, in several disease models. It is a promising therapeutic cardioprotective agent in ischemic heart disease, it ameliorates cardiac function and reduces arrhythmic episodes for those who suffer from heart failure and atrial fibrillation and it's also able to protect against tachycardia, based on some experiments carried out in *Drosophila melanogaster* [3-5].

BGP-15 has potentials in Duchenne muscular dystrophy (DMD), it could be a useful addition to the therapy, it improves cardiac pathology in DMD and also ameliorates dystrophic pathology [6].

The pharmacon proved to be cytoprotective and chemoprotective too, it is a useful addition in chemotherapy, it can relieve some of the series side-effects of cytostatics. For example, in oxaliplatin-induced neuropathy it alleviates intestinal dysfunction and protects the skeletal muscle [7].

Cisplatin-induced kidney disease, or cardiac disease caused by imatinib can be prevented or reversed by BGP-15 treatment [8]. The main indication of the molecule is that it is able to increase insulin sensitivity in an insulin resistant state, moreover it improves insulin resistance caused by atypical antipsychotic drugs (AAPD) [9-10]. In addition, BGP-15 proved to be a promising photoprotective agent against UV radiation [11]. BGP-15 exhibits protective effects in the progression of ROS related and inflammatory diseases [12].

3. Mode of action

BGP-15 is a multitarget compound, the exact mechanism of the effect is still unknown, it's under investigation, many research groups are studying this molecule. All of the beneficial effects mentioned above are based or linked to the following mechanisms: BGP-15 increases heat shock protein expression, it is a co-inducer of Hsp72. The activation of Hsp72 increases insulin sensitivity by preventing the phosphorylation, thus the activation of JNK, which is an inflammatory signaling protein [9]. It's also a poly (adenosine 5'-diphosphate)-ribose] polymerase 1 (PARP-1) inhibitor. Pharmacological inhibition of PARP and reducing the production of reactive oxygen species (ROS) can be effective in a wide selection of diseases by protecting the cells against death [3].

4. Conclusions

As shown above, BGP-15 is a versatile agent, with many potentials. It can be administered both internally and externally. Although the exact mechanism of action is not known, the above mentioned modes of action can explain why the phar-

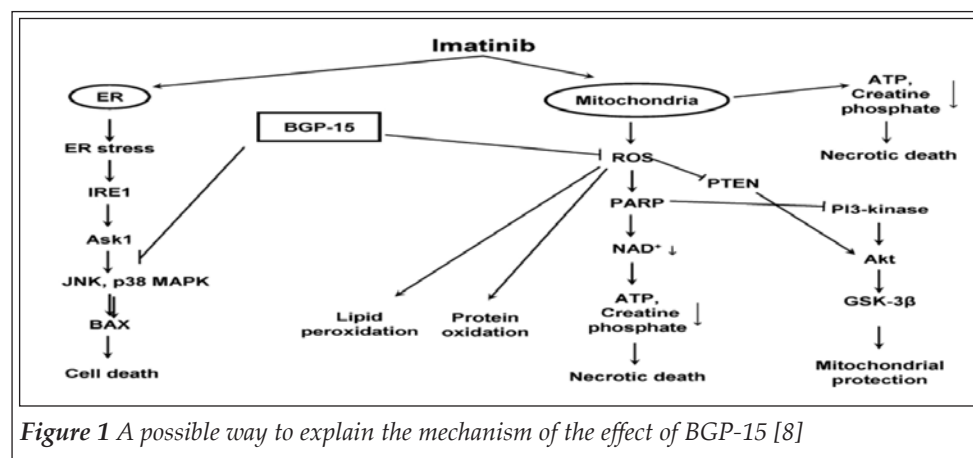


Figure 1 A possible way to explain the mechanism of the effect of BGP-15 [8]

macon has so many beneficial effects. The effects and the connected therapeutic possibilities are investigated by many research groups all over the world. If BGP-15 successfully clinical trial it can be a useful therapeutic choice for many diseases [13].

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