

GLAXOSMITHKLINE PLC  
Form 6-K  
September 14, 2011

FORM 6-K

SECURITIES AND EXCHANGE COMMISSION  
Washington D.C. 20549

Report of Foreign Issuer

Pursuant to Rule 13a-16 or 15d-16 of  
the Securities Exchange Act of 1934

For period ending September 2011

GlaxoSmithKline plc  
(Name of registrant)

980 Great West Road, Brentford, Middlesex, TW8 9GS  
(Address of principal executive offices)

Indicate by check mark whether the registrant files or  
will file annual reports under cover Form 20-F or Form 40-F

Form 20-F  Form 40-F

--

Indicate by check mark whether the registrant by furnishing the  
information contained in this Form is also thereby furnishing the  
information to the Commission pursuant to Rule 12g3-2(b) under the  
Securities Exchange Act of 1934.

Yes No

--

GlaxoSmithKline plc (the "Company") announces that in accordance with the authority granted by shareholders at the Company's Annual General Meeting on 5th May 2011 it purchased 1,500,000 of its Ordinary shares of 25 pence each ("shares") on 14 September 2011.

The highest price paid per share was 1,288 pence per share.

The lowest price paid per share was 1,277.5 pence per share.

The shares will be cancelled.

Following the cancellation of these shares; the Company holds 505,396,816 of its shares in Treasury, representing 9.06% of the total issued share capital of the Company and 9.97% of the total voting rights.

The Company has 5,070,529,351 shares in issue (excluding Treasury shares). This number represents the total voting rights in the Company and may be used by shareholders as the denominator for the calculations by which they can determine if they are required to notify their interest in, or a change to their interest in the Company under the Financial Services Authority's Disclosure and Transparency Rules.

This announcement does not constitute, or form part of, an offer or any solicitation of an offer to purchase or subscribe for securities in any jurisdiction and is in conformity with the Financial Services Authority's Disclosure and Transparency Rules.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorised.

GlaxoSmithKline plc  
(Registrant)

Date: September 14 2011

By: VICTORIA WHYTE  
-----

Victoria Whyte  
Authorised Signatory for and on  
behalf of GlaxoSmithKline plc