**Supplemental Figure 1.** SDS polyacrylamide gel of fractionated canine immunoglobulins. Immunoglobulin fractions were analyzed by SDS polyacrylamide gel electrophoresis by the method of Laemmli\textsuperscript{15} on a 10.5% acrylamide gel loaded with 10.5 µg of protein per lane. The gel was stained with Coomassie Brilliant Blue R-250. Immunoglobulin fractions are labelled W, X, Y, and Z according to the convention of Mazza et al.\textsuperscript{14} SeeBlue Plus2 prestained markers (ThermoFisher Scientific) were run in the lane marked ‘Std’. The apparent molecular weights (MW\textsubscript{app}) are indicated on the left.

**Supplemental Figure 2.** Multiplex bead assay detection of antibodies to recombinant HSP1-GST and HSP2-GST fusion proteins. Multiplex bead assays were conducted as described in the Materials and Methods using magnetic beads covalently coated with either HSP1-GST (left) or HSP2-GST (right). Biotinylated monoclonal secondary antibody 4E3D9 was used to detect responses in sera from dogs previously infected with GW (n = 39) or in dog sera from a non-endemic region of Chad (n = 41). Individual values are indicated by open circles. Note that two negative values for the HSP1-GST assay and three negative values for the HSP2-GST assay are not plotted as they fell below the range of the graph. Boxes include values between the 25\textsuperscript{th} and 75\textsuperscript{th} percentiles. Whiskers and closed circles represent the 10\textsuperscript{th} and 90\textsuperscript{th} and the 5\textsuperscript{th} and 95\textsuperscript{th} percentiles, respectively. Median values are indicated by a horizontal line within the boxes. Distributions that show statistically significant differences (P<0.05) using the Kruskal-Wallis one-way analysis of variance on ranks are indicated by brackets with asterisks.
**Supplemental Figure 3.** Receiver-operating characteristic (ROC) curve results of responses from HSP1-GST multiplex bead assays using different detection reagents. Curves were constructed using MFI-bg responses of samples collected from individuals with previous GW infection ($n=39$) or from individuals from a non-endemic region of Chad ($n=41$). Antibody responses were detected with either an anti-IgG Fc polyclonal antibody (anti-IgG, black dashed line), an anti-IgG$_1$ polyclonal antibody (anti-IgG$_1$, red line), an anti-IgG$_2$ monoclonal antibody (anti-IgG$_2$, red dashed line), or the 4E3D9 monoclonal antibody (anti-IgG$_4$, black line) as described in the Materials and Methods section. The optimal threshold for the HSP1-GST assay with the 4E3D9 antibody was 94.5 MFI-bg with a sensitivity of 71.8% and a specificity of 73.2%.

**Supplemental Figure 4.** ROC curve results of responses from HSP2-GST multiplex bead assays using different detection reagents. Curves were constructed as described in Supplemental Figure 3. The optimal threshold for the HSP2-GST assay with the 4E3D9 antibody was 96 MFI-bg with a sensitivity of 69.2% and a specificity of 82.9%.